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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

JANUARY 1954
Volume 5 No. 1

ASHEVILLE: 1954

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NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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CLIMATOLOGICAL DATA
NATIONAL SUMMARY

Volume 5 No. 1 JANUARY 1954

GENERAL SUMMARY OF WEATHER CONDITIONS

Nationwide temperature and precipitation averages were about normal, as were also the percentage of sunshine and average speed of the wind in most sections of the Country. Snowfall, unusually heavy in the Northwest, and the Atlantic coastal States from North Carolina to New Jersey, was also above normal in the Central Interior except in an area extending from Illinois and Wisconsin to the Rocky Mountains where amounts were less than half of normal. Severe storms and storm losses for January were less than usual.

The low-temperature record for the United States was broken on the morning of the 20th at Rogers Pass, Mont., with a reading of -69.7 °F. The previous record, -66 °F., was recorded at Riverside Ranger Station in Yellowstone National Park, February 9, 1933. This is the 11th official reading of -60° or lower in the United States and the fourth such reading in the month of January. Monthly averages, below normal in northern areas east of the Divide were above normal elsewhere. In the Northeast temperatures averaged below normal for the first month since September 1952 and for the first January since 1948. The greatest average departures from normal occurred in the northern Rocky Mountain region, where they ranged from 9° above normal at Boise, Idaho, to 13° below at Havre, Mont. Daily average temperatures at these two stations differed by 62° on the 23d.

In the central and lower Great Plains and upper Mississippi Valley precipitation was not sufficient to materially improve the drought situation that developed during the latter part of 1953. Monthly totals were well above normal near the Canadian Border west of the Great Lakes, along the Pacific Coast, in parts of the far Southwest, and in an area extending from Arkansas eastward to the Atlantic Coast and northeastward through Indiana. Heavy rains the latter part of the month broke the drought that had developed in the Los Angeles area of southern California, and replenished soil moisture and greatly improved water supplies in Kentucky and southern portions of Illinois and Indiana; but they also produced damaging floods in the San Gabriel Mountain district of California and in the southern end of the Appalachian Mountains and surrounding districts.

PRECIPITATION.--In large areas of the upper Mississippi Valley and central and lower Great Plains precipitation was less than 25 percent of normal and in nearly all of this region it was less than 50 percent. Monthly totals generally were less than 0.50 inch in the upper Mississippi Valley, and less than 0.25 inch in the central and lower Great Plains where scattered stations reported no precipitation at all. For Nebraska the average precipitation, 0.09 inch, was the least for January since 1900 and the second lowest on record, and for Iowa 0.26 inch for the month was the third lowest on record. Water supplies continued low in southern Iowa, northwestern Missouri, northeastern Oklahoma, and parts of Kansas. Rainfall was less than 25 percent of normal in much of Florida and adjacent areas of Georgia and Alabama and less than 50 percent in most of the remainder of the Gulf Region, but thanks to the generous rains of December soil moisture remained ample.

In an area extending from Virginia and North Carolina through Tennessee and Arkansas and including parts of several adjoining States and the lower Ohio Valley, precipitation was unusually heavy for January. Raleigh, N. C., had a monthly total of 8.4 inches (a new January record). The highest monthly totals for several of the States in this area were: Coweeta, N. C., 17.12 inches: Haw Nob, Tenn., 16.06: Flat Top, Ga., 16.01: Shoemaker Springs, Ala., 13.31; and Caesars Head, S. C., 12.29 inches. Heaviest rains fell during the periods 14-16th and 20th-22d, with totals for each period ranging from about 1 to 6 inches. These heavy rains resulted in widespread minor to locally severe flooding that caused losses estimated at $315,000 in Alabama, $360,000 in North Carolina, $100,000 in South Carolina, and $116,000 in Georgia.

In Kentucky percipitation that occurred almost daily after the 10th averaged over 5 inches for the State, and individual point values ranged from 2.12 up to 6.05 inches. The statewide average was above normal for the first time since May 1953, and by the end of the month soil moisture had been replenished and water hauling had ceased. In southern Illinois heavy snow on the 9th and 10th and substantial rains on the 14-15th and again on the 20th produced monthly totals ranging from 2 to 6 inches, which were sufficient to relieve the soil moisture shortage continuing from the fall drought of 1953. In Indiana the continued rainfall deficiency during the first 2 or 3 weeks resulted in some of the lowest January river stages in many years and in continued failure of many wells, but after heavy rains on the 20th and 26th wells began furnishing near normal water supplies again.

Precipitation was above normal from northern Minnesota to the Pacific Coast and unusually heavy in the northern Rockies. For Montana the statewide average of 1.42 inches was the third highest on record for January, and monthly station totals ranged up to 11.91 inches at East Glacier, Mont., and 13.41 inches at Burke, Idaho.

In Washington, western Oregon, most of California, southern Nevada and western portions of Utah and Arizona, precipitation was well above normal. Some of the highest monthly totals were: Upper Mattole, Calif., 31.58 inches: Cougar, Wash., 30.69; Illahe, Oreg., 27.11; Alta, Utah, 6.71: Camp Wood, Ariz., 5.14; and Glenbrook, Nev. 3.53 inches. In southern portions of California and Nevada, and western Arizona, ranges were benefited and water supplies improved. In the Los Angeles district of southern California drought conditions were broken by heavy rains that began on the 17th and continued through the 20th, producing totals ranging from 2 to 4 inches in coastal areas and up to 10 inches in the mountains. But they also caused flash floods in the watershed districts of the San Gabriel Mountains where losses were estimated at more than a quarter of a million dollars.

SNOWFALL.--At the beginning of the month the snow cover east of the Rocky Mountains was limited to extreme northern areas where depths up to 20 inches were reported in northern Minnesota and northern New England. In the far West the mountain snow pack was generally below normal.

Most of the heavy snowfall in the Northwest occurred from the 14th to the 25th. In northern Idaho 24 inches of snow fell at Porthill during the 14th and 15th, and 3- to 4-foot falls were general during the 10-day period beginning the 14th. In western Washington State total snowfall ranged from 15 to 30 inches at lower elevations to over 200 inches in the Cascades, and from 8 to nearly 50 inches in the eastern portion of the State. More than a foot of snow covered most of the eastern wheat belt of this State during the latter half of the month. At Mount Baker Lodge, Wash., heavy snow during the week ending the 25th increased the depth there from 185 to 283 inches. Snowfall in Montana averaged 22 inches, the greatest for any month since 1895. In Oregon the greatest monthly fall, 216 inches, occurred at Crater Lake. In California snowfall was near normal in the Cascades but diminished to less than 40 percent of normal in the southern Sierra Nevadas.

East of the Rocky Mountains snowfall was rather frequent during the second and third decades. On the 10th and 11th snow fell as far south as the northern portions of the Southern States, with heavy falls of 6 to 10 inches occurring along the north Atlantic Coast where depths on the morning of the 11th were 9 inches at Philadelphia, Pa., 6 inches at Providence, R. I., and 11 inches at Boston, Mass. More than a foot fell at some points in the Great Lakes Region during this storm, and the depth at Houghton, Mich., was increased from 14 to 26 inches. Frequent mostly light snow in the North-Central Interior during the remainder of the month increased the accumulation at Houghton, Mich., to 35 inches. Another heavy snowstorm occurred along the Atlantic Coast from North Carolina to New Jersey on the 22d when falls of 10 to 12 inches were reported in eastern Maryland.

Despite the frequent and sometimes heavy snows east of the Rocky Mountains drifting was less than usual and travel was not seriously interrupted. The extent of snowcover at the end of the month was only slightly greater than at the beginning with most of the increase occurring in the northern Great Plains and southern New England and New York.

TEMPERATURE.--January temperatures were unusually low in northern areas from about the 14th to 27th. At Havre, Mont., the temperature remained below zero from the 15th through the 26th and on the 20th it averaged -36° (maximum -28°, minimum -43°) or 52° below normal. On the morning of the 20th, when the National low-temperature record was broken at Rogers Pass and minima were below -50° also at several other stations in Montana, Pembina, N. Dak., recorded -48° and Ralph and Harding, S. Dak., -40°: and on the 21st, Red Lake Falls, Minn., reported -50° and Gordon, Wis., -46°. For the month, average temperatures were below zero at several north-central stations including Munich, N. Dak., -8.2°, Bandette, Minn., -7.3° and Raymond Border Station, Mont., -6.7°.

The low temperatures in northern areas on the 20th extended to the west Coast and subzero minima to the Cascades (Yakima, Wash., -19°), and on the 21st subzero minima extended south to northern Texas (Littlefield -4°). Lowest temperatures in the Great Lakes region occurred on the 17th when Ironwood, Mich., recorded -31°; and at many stations in the Northeast on the 18th when Burlington, Vt., recorded -22°.

Although freezes occurred in most southern areas at least once during the month, they were not responsible for any significant damage. In the far Southwest lowest temperatures occurred generally on the 1st or 14th (Phoenix, Ariz., 29° on the 1st). In the Southeast, cold snaps on the 6-8th and 12-13th brought frost to the Everglades of Florida.

West of a line extending from Chicago, Ill., to El Paso, Tex., highest temperatures occurred either during the first week or the last 3 days, while east of this line they generally were recorded at most stations from the 19th to 27th. The highest temperature of the month was 92° at El Cajon and Yale Ranch, Calif., on the 5th.

DESTRUCTIVE STORMS.--Most of the month's storm losses occurred in the Pacific Northwest where general windstorms, accompanied by snow or rain, on the 2-3d, 21-22d, and 25-27th caused over $500,000 damage, most of it in western Washington and Oregon.

On the 20th tornadoes occurred in Oktibbeha and Lowndes Counties, Miss., resulting in 2 injuries and $13,500 damage.

CONDENSED CLIMATOLOGICAL SUMMARY

JANUARY 1954

Section	Temperature								Precipitation					
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes			
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least
	°F.	°F.		°F.			°F.		In.	In.		In.		In.
Alabama	47.7	+0.8	4 Stations	79	°21	Russellville 2	11	12	4.09	-0.93	Shoemaker Springs	13.31	Tuskegee	0.53
Arizona	43.4	+2.9	5 Stations	85	°7	Maverick	-15	23	1.24	+.25	Camp Wood	5.14	Yuma Valley	.01
Arkansas	41.5	+.3	Camden 1	81	21	2 Stations	-5	°11	6.08	+1.64	Marianna	10.05	Gravette	1.47
California	44.9	+1.1	El Cajon Yale Ranch	92	5	Mount Hebron RS	-11	25	5.60	+1.62	Upper Mattole	31.58	Calexico	.19
Colorado	29.4	+6.1	Eversoll Ranch	76	7	Fraser	-25	11	.49	-.44	Wolf Creek Pass 4W	6.18	3 Stations	T
Connecticut	24.8	-2.3	Cream Hill	58	21	2 Stations	-21	°14	2.25	-1.59	Kent	3.34	Bridgeport WB AP	1.26
Delaware	34.8	-.8	Lewes	69	27	Newark College Farm	-2	18	2.58	-1.00	Lewes	3.58	Middletown 2S	1.51
Florida	61.5	+2.2	2 Stations	88	°20	Blountstown 2SE	25	6	.99	-1.70	Longboat Key	4.04	Port Mayaca S.L. CNL	.00
Georgia	49.9	+1.6	Savannah USDA Pl Gdn	83	21	Blairsville Exp. Sta.	6	13	2.66	-1.40	Flat Top	16.01	Folkston 9SW	.58
Idaho	28.6	+5.1	Nampa 2NW	62	29	Dixie	-30	20	2.81	+.80	Burke 2NNE	13.41	2 Stations	.05
Illinois	29.6	+1.9	2 Stations	67	°8	Stockton	-15	17	1.66	-.67	Glendale Exp. Farm	6.05	Avon	.33
Indiana	30.9	+2.2	Bedford	64	20	Whiting	-10	17	2.80	-.20	Evansville	5.81	Whiting	1.06
Iowa	19.0	-.7	Shenandoah	64	29	Esterville	-26	21	.26	-.75	Keokuk	1.00	Mount Ayr 2N	.00
Kansas	29.9	-.4	Elkhart	74	7	Syracuse	-14	22	.12	-.54	Deerfield 10NNW	.84	Several Stations	T
Kentucky	36.7	+.6	2 Stations	70	°20	Farmers	-14	13	5.32	+.73	Albany	9.74	Greenup Dam 30	2.12
Louisiana	53.2	+1.5	North Livingston	85	20	3 Stations	19	°11	4.07	-1.57	Starks Fire Tower	6.76	Camp Polk	1.68
Maine	14.6	-2.6	Bar Harbor	52	21	Fort Kent	-35	°11	3.06	-.31	Machias	5.14	Fort Kent	1.55
Maryland	34.0	+.4	9 Stations	73	°27	Oakland	-14	18	2.54	-.82	Emittsburg	6.61	Baltimore Sledds Pt.	.96
Massachusetts	24.0	-2.6	Sandwich	58	3	Birch Hill Dam	-25	14	3.02	-.69	Salem Air Sta.	6.11	Westfield	1.57
Michigan	19.9	-.2	2 Stations	53	°20	Ironwood	-31	17	1.64	-.16	Houghton CAA AP	4.20	Watersmeet F. H.	.72
Minnesota	3.8	-5.0	Winona	43	24	Red Lake Falls	-50	21	.79	+.04	Grand Marais	2.47	2 Stations	.04
Mississippi	48.5	+.9	Columbia	82	21	5 Stations	17	°12	5.29	+.05	Pleasant Hill	12.26	Brooklyn 2SE	.89
Missouri	31.9	+1.1	Appleton City	73	8	2 Stations	-12	21	1.73	-.58	New Madrid	6.06	Gallatin	T
Montana	12.2	-6.3	Boyes	69	6	Rogers Pass	-68	20	1.42	+.69	East Glacier	11.91	Argenta	T
Nebraska	23.7	+.5	Bridgeport	69	7	Gordon 1E	-21	°20	.09	-.46	2 Stations	.43	7 Stations	.00
Nevada	33.9	+3.2	North Las Vegas DOX	79	31	Montello	-21	26	.94	-.12	Glenbrook	3.53	Sand Pass	.05
New Hampshire	16.9	-2.4	Fabyan	56	21	Fabyan	-31	18	2.75	-.28	Dublin	6.23	Lakeport 2	1.89
New Jersey	29.7	-1.4	Millville CAA AP	66	27	Long Valley	-15	18	2.07	-1.56	Pleasantville 1N	3.69	Rahway	1.18
New Mexico	37.3	+3.6	Jal	79	25	Gavilan	-24	1	.34	-.28	Batemans Ranch	2.38	3 Stations	.00
New York	19.7	-2.9	New York Laurel Hill	58	26	2 Stations	-31	18	2.74	-.12	2 Stations	6.10	Wolcott	1.17
North Carolina	42.6	+.2	4 Stations	78	21	do	-3	13	6.20	+2.51	Coweeta No. 8	17.12	Whiteville	2.43
North Dakota	-.9	-7.8	Hettinger	55	6	Pembina 2N	-48	21	.71	+.23	Rugby	1.67	Elgin	.08
Ohio	31.0	+1.7	Ironton	66	19	2 Stations	-8	°13	2.53	-.44	Painesville 2N	3.67	Thornville	1.11
Oklahoma	39.0	+1.0	3 Stations	79	°7	Tahlequah	-6	11	1.00	-.55	Clayton	8.48	Alva	T
Oregon	34.2	+2.5	Lacomb 1WNW	68	6	Austin 3S	-22	20	6.54	+2.66	Illahe 1N	27.11	Rome	.06
Pennsylvania	27.4	-1.2	4 Stations	68	°27	Hawley 1S Dam	-22	18	2.10	-1.10	Kregar 4SE	4.72	Selinsgrove CAA AP	.98
Rhode Island	27.2	-2.5	Greenville	55	21	Kingston	-18	18	2.87	-1.14	Block Island WB AP	3.17	Austin	2.38
South Carolina	47.6	+1.3	Yemassee 4W	83	22	Caesars Head	5	13	3.44	+.01	Caesars Head	12.29	Beaufort 7SW	.70
South Dakota	13.4	-3.7	Rapid City	66	6	2 Stations	-40	°20	.19	-.36	Belle Fourche 25NNE	.65	11 Stations	T
Tennessee	40.3	+.8	Memphis WB AP	73	20	Greenville Exp. Sta.	0	13	9.85	+4.72	Haw Knob	16.06	Kenton	5.53
Texas	49.2	+2.2	3 Stations	90	20	Littlefield	-4	21	1.02	-.58	Naples 5NE	5.78	7 Stations	.00
Utah	30.3	+5.5	Zion NP	71	31	Snowville	-18	26	1.24	+.07	Alta	6.71	Hanksville CAA AP	T
Vermont	13.9	-4.0	Readsboro 1SSE	57	21	Enosburg Falls	-34	18	2.79	.00	Peru	4.98	2 Stations	1.91
Virginia	37.2	+.5	Culpeper	75	27	Berryville	-11	23	4.04	+.73	Rose Hill	9.13	do	1.49
Washington	29.7	-1.1	3 Stations	62	6	Chesaw	-29	20	7.08	+2.71	Cougar 5E	30.69	do	.73
West Virginia	33.8	+.7	Moorefield	73	26	Hamlin	-12	13	3.30	-.37	Kumbrabow St. For.	6.40	Martinsburg CAA AP	.95
Wisconsin	14.4	+.1	4 Stations	45	°2	Gordon 2ESE	-46	21	.71	-.53	Brule Ranger Sta.	E1.97	Neillsville	.11
Wyoming	24.2	+5.6	Torrington Exp. Farm	69	31	Rockypoint 1E	-37	20	.74	-.10	Snake River	6.24	2 Stations	.00
Puerto Rico	73.1	+.4	Dos Bocas	93	1	Utuado	50	20	2.61	-.58	Rio Blanco (1800 Ft. Elev.)	13.54	Coamo Dam (5)	.00

° Other dates also.

E Water equivalent of snowfall wholly or partly estimated, using a ratio of 1 inch of water equivalent to every 10 inches of new snowfall.

Note: Dates in Table 1 apply to the period 24 hours prior to time of observation. In some cases the actual occurrence is on the calendar date preceding that shown. (See individual Climatological Data for times of observations).

CLIMATOLOGICAL DATA

Table 2 JANUARY 1954

State and station	Elevation (ground)	Pressure		Temperature										Average dew point	Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below			Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
ALABAMA																																
Birmingham	610	997.0	1022.6	58	35	46.2	+1.0	73	20	23	°13	0	16	37	73	6.35	+1.37	3.19	10	3	T	T	6.5	S	31	SW	15	5	6	20	7.0	45
Mobile	10	1015.2	1023.3	64	43	53.5	+.8	73	°27	29	13	0	5	46	79	1.18	-3.67	.39	9	0	.0	0	11.2	N	--	---	--	8	9	14	6.6	--
Montgomery CO	201	------	------	61	41	50.9	+.6	76	21	27	°13	0	4	--	--	.83	-3.78	.40	7	--	T	T	----	---	--	---	--	--	--	--	---	--
Montgomery	198	1015.2	1022.9	62	38	49.9	+.7	78	21	26	12	0	8	41	75	.72	-3.88	.39	5	0	T	T	8.5	NW	30	S	15	5	9	17	6.7	50
ARIZONA																																
Flagstaff	6993	------	------	44	13	28.5	+3.2	56	°4	-5	14	0	30	--	--	1.97	+.28	.97	6	0	28.3	15	----	---	--	---	--	10	6	15	6.2	--
Phoenix	1114	977.7	1017.3	66	38	52.3	+2.6	81	31	29	1	0	4	35	58	.88	+.28	.67	4	0	.0	0	3.9	E	*20	SSE	12	13	5	13	5.1	84
Prescott	5014	847.3	1018.9	52	25	38.5	+3.2	66	31	15	°1	0	28	19	54	1.45	+.35	.65	5	0	7.7	2	5.6	SW	26	SE	°11	11	6	14	5.5	65
Tucson	2558	927.2	1016.5	68	39	53.5	+3.8	79	°5	31	4	0	3	23	38	.78	+.15	.48	3	0	.0	0	5.8	SE	31	SE	31	15	1	15	5.6	81
Winslow	4880	852.7	1020.0	50	22	35.8	+3.1	63	31	-5	1	0	29	23	61	.28	-.09	.25	2	0	2.9	2	5.4	SE	*42	SW	25	9	6	16	5.9	--
Yuma	199	1011.5	1016.6	71	42	56.6	+1.3	85	31	32	1	0	1	29	41	.05	-.28	.03	2	0	.0	0	8.8	N	26	N	°9	13	11	7	4.2	86
ARKANSAS																																
Fort Smith	458	1004.4	1021.7	51	28	39.2	-.8	71	7	5	11	0	22	30	75	4.87	+1.98	2.19	9	3	6.3	4	9.1	NE	28	SW	8	8	8	15	6.3	39
Little Rock	257	1008.5	1022.0	52	32	41.8	.0	72	20	17	11	0	16	33	72	7.76	+2.64	2.32	11	3	4.0	3	9.2	S	31	SW	20	7	5	19	7.1	34
Texarkana	361	1008.1	1021.8	57	37	46.8	+.9	80	20	19	22	0	9	39	75	4.31	-.31	1.28	11	5	.6	T	----	---	--	---	--	8	3	20	7.2	--
CALIFORNIA																																
Bakersfield	489	1001.7	1020.0	60	37	48.5	+1.6	71	6	31	10	0	2	38	70	1.86	+.84	1.09	5	0	.0	0	3.2	ENE	*25	WNW	24	8	8	15	6.3	--
Bishop	4108	873.7	1016.6	55	21	38.0	+.1	67	°7	11	2	0	30	--	--	1.68	+.56	1.64	3	0	T	0	----	---	--	---	--	8	10	13	5.7	--
Blue Canyon	5280	837.5	1017.3	41	29	34.9	-1.3	63	31	20	25	0	25	--	--	11.18	+2.01	4.17	13	0	60.0	29	----	---	--	---	--	6	2	23	7.8	--
Burbank	699	991.5	1017.8	64	42	52.9	+.3	87	31	33	16	0	0	39	66	4.47	+2.12	2.34	9	1	.0	0	3.2	S	*19	SSE	19	12	5	14	5.8	--
Eureka CO	43	1014.9	1017.3	53	42	47.0	-.2	65	29	30	25	0	1	--	--	11.78	+5.58	2.06	21	0	.0	0	8.1	---	31	SE	27	1	7	23	8.6	25
Fresno	331	1006.8	1019.0	58	36	46.7	+2.0	72	6	27	14	0	9	39	77	1.80	+.23	1.16	5	0	.0	0	5.2	SE	20	E	17	5	10	16	6.8	61
Los Angeles CO	312	------	------	64	47	55.6	+.6	86	31	41	1	0	0	42	76	4.60	+2.22	1.52	9	1	.3	T	6.2	---	31	E	12	10	7	14	5.5	68
Los Angeles	99	1013.9	1017.7	62	45	53.5	+.3	86	31	40	°3	0	0	45	65	4.78	+2.77	1.56	9	1	T	T	5.5	W	†43	SE	19	10	6	15	5.9	--
Mt. Shasta	3543	891.8	1017.6	40	28	33.7	+.9	54	5	6	25	0	25	--	--	12.42	+7.88	3.36	18	0	74.0	34	----	---	--	---	--	3	1	27	8.7	--
Oakland	3	1019.0	1019.3	55	42	48.5	+1.3	62	30	32	25	0	1	42	79	2.85	-.45	1.42	12	0	T	T	5.6	SSE	*32	SSE	17	3	11	17	7.2	--
Red Bluff	341	1005.4	1018.2	53	38	45.6	+.5	67	30	28	25	0	6	38	75	3.55	-.18	1.03	14	0	.0	0	11.7	SSE	50	SE	17	7	4	20	7.5	43
Sacramento	17	1018.0	1018.8	55	38	46.4	+2.1	61	11	26	25	0	4	40	79	2.67	+.01	1.70	10	0	.0	0	9.4	SE	60	SE	17	7	6	18	7.0	38
Sandberg CO	4517	862.9	1018.1	47	34	40.2	+.4	62	6	25	13	0	12	25	62	4.90	+2.60	2.37	7	1	18.0	12	17.2	ENE	--	---	--	8	11	12	5.8	--
San Diego	19	1014.6	1017.7	63	47	55.0	+.1	73	5	42	°1	0	0	45	73	2.76	+1.07	.82	8	1	.0	0	5.8	NE	31	S	19	13	5	13	5.3	66
San Francisco CO	52	------	------	56	47	51.5	+1.4	62	°13	41	°24	0	0	--	--	3.11	-.92	1.20	14	0	.0	0	7.1	---	32	S	17	6	6	19	7.2	47
San Francisco	1	1018.3	1019.0	56	43	49.5	+1.6	62	°29	31	25	0	1	44	81	3.07	-.40	1.63	14	0	.0	0	8.1	WNW	48	S	17	3	11	17	7.5	--
Santa Maria	231	1010.2	1018.9	60	39	49.6	-.8	82	31	29	1	0	3	41	76	3.34	+.63	1.25	9	0	.0	0	7.9	E	*30	NNE	31	9	8	14	6.1	--
COLORADO																																
Alamosa	7534	771.1	1023.7	38	5	21.6	+4.7	50	°29	-10	1	0	31	--	--	.28	+.05	.20	5	0	5.2	3	----	---	--	---	--	9	17	5	4.9	--
Colorado Springs	6175	808.3	1018.0	49	22	35.4	+6.6	65	31	-1	21	0	29	12	44	.22	.00	.14	4	0	2.6	2	10.5	SE	*46	NW	2	11	7	13	5.5	--
Denver	5292	835.1	1015.8	50	22	36.3	+7.6	70	31	1	20	0	26	15	49	.23	-.27	.19	4	0	2.7	2	10.2	S	28	W	18	9	8	14	6.1	67
Grand Junction	4849	861.5	1021.6	43	22	32.7	+8.7	58	30	10	1	0	30	21	65	.35	-.25	.29	4	0	3.0	2	5.5	ESE	35	NW	25	4	11	16	7.2	51
Pueblo	4799	855.4	1017.8	53	21	36.6	+7.2	69	°6	-1	13	0	28	19	56	.28	-.10	.26	3	0	3.8	3	8.4	W	37	W	23	8	9	14	5.7	74
CONNECTICUT																																
Bridgeport	7	1019.0	------	36	20	27.6	-1.6	50	21	-1	18	0	28	--	--	1.26	-2.17	.35	13	1	11.1	6	----	---	--	---	--	7	9	15	6.8	--
Hartford	15	1013.9	1020.0	33	16	24.5	-2.5	51	26	-11	18	0	30	15	69	2.06	-1.68	.51	16	1	17.1	8	8.0	NNW	31	SW	30	6	4	21	7.5	34
New Haven	6	1014.9	1019.3	34	19	26.4	-2.7	50	21	-1	14	0	27	--	--	2.51	-1.38	.64	15	0	18.1	10	8.0	---	26	N	11	5	9	17	7.1	45
DELAWARE																																
Wilmington	73	1017.3	1020.3	40	23	31.3	-2.0	64	27	2	18	0	27	22	70	1.71	-1.85	.60	11	1	11.5	8	9.4	WNW	--	---	--	7	6	18	6.9	--
DIST. OF COLUMBIA																																
Washington CO	72	------	------	44	28	36.1	-.4	72	27	12	23	0	23	--	--	3.01	-.40	1.18	11	0	12.8	7	----	---	35	W	28	--	--	--	---	--
Wash. Nat'l AP	14	1016.6	1020.8	44	28	35.9	-.3	72	27	13	23	0	25	25	68	2.30	-.94	.84	11	0	11.3	6	10.8	SSW	47	W	28	6	9	16	6.6	48
FLORIDA																																
Apalachicola CO	13	1021.0	1022.4	62	48	54.8	-.4	71	3	34	12	0	0	--	--	.85	-2.76	.48	6	0	.0	0	7.5	---	26	S	5	7	15	9	5.7	46
Daytona Beach	31	1021.0	1022.5	71	50	60.8	+1.3	82	21	34	12	0	0	52	80	.37	-1.73	.25	7	0	.0	0	10.5	NNW	*28	SW	22	6	13	12	6.2	--
Fort Myers	15	1021.0	1021.7	77	53	64.8	+.2	86	°21	38	12	0	0	55	79	.30	-1.22	.26	3	0	.0	0	7.4	E	*20	WNW	6	11	11	9	4.9	--
Jacksonville CO	18	------	------	68	49	58.1	+.8	80	21	33	13	0	0	--	--	.77	-2.05	.40	8	--	.0	0	----	---	--	---	--	--	--	--	---	--
Jacksonville	24	1022.4	1023.1	68	45	56.7	+.8	80	21	32	13	0	1	47	76	.85	-1.83	.67	7	0	.0	0	8.4	NW	39	W	11	7	10	14	6.4	46
Key West CO	9	1019.3	1020.0	78	66	71.8	+1.0	83	°21	56	12	0	0	64	81	.33	-1.21	.33	1	0	.0	0	8.0	N	19	NE	14	22	8	1	3.3	76
Lakeland CO	214	------	------	73	53	62.7	+.7	83	21	39	12	0	0	--	--	.68	-1.48	.55	3	1	.0	0	6.6	---	--	---	--	9	11	11	5.4	65
Miami CO	8	------	------	75	63	68.8	+.3	83	16	44	12	0	0	--	--	.60	-1.55	.41	6	1	.0	0	12.4	---	30	SE	19	9	21	1	4.5	78
Miami	8	1019.6	1020.8	77	61	69.1	+.8	85	16	44	12	0	0	59	73	.49	-1.57	.31	4	1	.0	0	10.1	SE	*24	S	10	9	19	3	4.9	--
Miami Beach	9	------	------	76	66	70.8	+.8	84	16	46	12	0	0	--	--	.75	-1.29	.69	6	--	.0	0	----	---	--	---	--	11	5	15	---	--
Orlando	106	1018.0	1022.4	73	51	61.9	.0	83	°22	37	°12	0	0	54	80	.45	-1.60	.31	3	1	.0	0	9.3	N	*40	W	11	6	14	11	5.7	--
Pensacola CO	13	1020.3	------	63	45	54.1	+.1	78	27	32	°13	0	2	--	--	1.89	-2.66	.89	7	2	.0	0	7.5	---	31	NW	10	5	11	15	6.6	52
Pensacola CAA AP	118	------	------	--	--	----	----	--	--	--	--	--	--	46	--	----	-----	----	--	--	---	--	9.6	NNW	--	---	--	--	--	--	---	--
Tallahassee	64	1020.0	1022.5	67	43	54.9	+1.3	79	27	32	°13	0	4	45	75	.79	-3.06	-.38	6	1	.0	0	5.3	NNW	--	---	--	7	13	11	5.9	--
Tampa	19	1021.0	1022.3	73	52	62.4	+.9	81	°21	39	°13	0	0	53	77	.99	-1.00	.53	6	0	.0	0	9.3	N	*32	WNW	11	9	12	10	5.4	73
West Palm Beach	15	1020.0	1020.8	77	60	68.2	+1.2	84	16	43	12	0	0	59	75	1.59	-.89	.81	9	1	.0	0	11.1	E	*35	WSW	11	6	15	10	5.8	--
GEORGIA																																
Albany	190	1015.6	1022.7	65	41	53.1	+1.7	79	20	28	13	0	6	42	71	.89	-3.37	.45	6	0	.0	0	4.7	NW	--	---	--	8	9	14	6.4	--
Atlanta CO	1054	------	------	54	36	44.9	+.3	68	27	19	13	0	11	--	--	4.58	+.06	1.94	6	0	T	0	----	---	--	---	--	--	--	--	---	--
Atlanta	977	980.0	1023.0	55	35	45.2	+.6	69	27	21	13	0	14	36	76	3.73	-.94	1.90	7	2	T	0	11.4	NW	35	S	16	9	9	13	6.2	45
Athens	798	993.6	------	55	35	45.1	+.4	72	27	22	13	0	12	--	--	3.11	-1.90	2.02	9	2	T	0	----	---	--	---	--	9	8	14	6.0	--
Augusta	143	1015.6	1022.2	61	36	48.3	-.4	74	°21	24	2	0	15	39	74	1.89	-1.57	.72	9	0	.0	0	6.5	WNW	*28	W	11	7	7	17	6.8	--
Columbus	385	1008.1	1022.7	61	37	49.2	+1.8	75	21	24	1	0	13	--	--	.87	-3.71	.35	6	0	.0	0	----	---	--	---	--	8	9	14	6.1	--
Macon	356	------	1022.0	63	38	50.4	+.9	79	21	27	°13	0	10	38	68	.69	-3.32	.29	5	0	.0	0	9.7	WNW	37	SW	16	8	9	14	6.2	58
Rome	637	999.0	1023.0	55	31	42.8	+.1	70	27	18	13	0	20	--	--	9.45	+3.90	4.15	11	3	.5	5	----	---	--	---	--	7	9	15	6.6	--
Savannah	48	1020.0	1022.5	65	41	53.1	+1.0	81	21	27	13	0	7	44	76	1.10	-1.35	.55	7	0	.0	0	8.6	WSW	32	W	11	9	9	13	6.0	54
Valdosta	200	1014.2	1022.6	67	43	54.9	+1.3	80	19	29	°13	0	5	46	--	1.24	-2.38	.93	7	0	.0	0	8.2	NW	--	---	--	7	12	12	5.8	--
IDAHO																																
Boise	2842	919.4	1017.2	44	29	36.5	+9.2	56	28	13	20	0	22	28	71	1.09	-.24	.36	14	0	2.2	1	11.7	SE	45	SW	17	3	5	23	8.4	31
Lewiston	1413	962.1	1014.9	40	26	32.6	+1.8	52	7	-10	20	0	20	--	--	.94	-.11	.23	16	0	6.5	3	----	---	--	---	--	1	7	23	8.6	--
Pocatello	4444	861.2	1018.3	39	22	30.4	+8.4	51	5	-4	25	0	28	23	72	.83	-.38	.38	11	0	5.3	5	13.5	SW	45	S	17	0	4	27	8.9	17
ILLINOIS																																
Cairo CO	314	1008.8	------	45	29	36.8	-.6	67	20	11	12	0	20	--	--	4.87	+.39	1.54	11	3	4.0	4	9.9	---	30	SW	8	6	9	16	6.8	44
Chicago	610	997.3	1021.2	35	20	27.7	+2.8	53	20	-7	17	0	29	18	69	1.10	-.74	.69	7	0	1.9	1	12.3	NW	31	NW	9	4	3	24	7.9	38
Moline	589	998.6	1022.1	33	14	23.3	+.1	47	°1	-8	17	0	31	16	73	.34	-1.16	.23	3	1	1.4	1	10.0	NW	34	NW	11	8	8	15	6.5	45
Peoria	654	998.3	1021.7	36	19	27.4	+2.4	53	20	-4	17	0	31	20	74	.89	-1.08	.57	4	2	.1	T	11.9	---	32	NW	6	4	10	17	7.3	41
Springfield	587	998.3	1022.3	39	21	29.7	+2.3	57	20	1	12	0	30	22	74	.85	-1.18	.43	4	2	T	T	14.8	NW	30	N	°21	4	8	19	7.2	38
INDIANA																																
Evansville	383	1006.4	1022.8	43	26	34.2	-.5	61	20	3	12	0	23	28	75	4.96	+1.03	2.07	10	2	5.0	3	12.0	NW	34	SW	2	8	3	20	6.9	39
Fort Wayne	801	988.2	1020.3	36	21	28.4	+2.1	54	°2	3	13	0	30	23	80	2.54	.00	1.14	11	0	5.8	3	14.2	WNW	40	W	27	4	6	21	7.7	29
Indianapolis	793	990.9	1021.5	39	22	30.8	+2.0	60	20	1	12	0	27	23	74	3.40	+.25	1.44	13	3	5.7	3	12.6	NW	40	SW	20	6	5	20	7.5	41
South Bend	768	991.5	1020.5	34	19	26.6	+2.0	52	°20	-2	17	0	29	21	81	1.63	-.37	.74	15	0	14.5	6	12.6	SSW	*30	NNW	20	2	7	22	8.3	--

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days		Average dew point		Total	Departure from normal	Greatest in 24 hours	No. of days		Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile			Clear	Partly cloudy	Cloudy		
												Max. 90° F. or above	Min. 32° F. or below						.01 inch or more	With thunderstorms	Total	Max. depth on ground			Speed	Direction	Date					
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
INDIANA (Cont.)																																
Terre Haute	578	1000.0	1021.8	40	23	31.1	+1.8	60	20	2	12	0	28	24	76	2.90	-0.10	1.52	7	3	1.8	2	10.1	S	34	NW	26	7	4	20	7.4	34
IOWA																																
Burlington	694	995.3	1022.2	34	15	24.6	+.6	50	°1	-7	17	0	31	16	72	.66	-1.08	.41	5	1	1.0	1	11.7	NW	32	NW	°11	10	7	14	6.5	62
Des Moines	948	989.2	1022.7	31	8	19.6	-2.5	55	29	-14	21	0	31	10	67	.07	-1.16	.03	4	0	.4	T	14.1	NNW	42	N	20	6	9	16	8.7	52
Dubuque	1065	980.7	1022.1	28	9	18.7	-.7	40	1	-15	17	0	31	14	78	.68	-.69	.37	6	0	3.8	4	----	---	--	---	--	5	9	17	7.1	--
Sioux City	1094	979.0	1022.7	28	4	16.0	-3.1	55	1	-17	21	0	31	5	65	.24	-.50	.14	4	0	2.9	2	11.0	NNW	32	NW	9	5	9	17	6.9	57
KANSAS																																
Concordia CO	1375	969.2	------	38	15	26.4	-1.7	65	29	-8	21	0	31	--	58	.08	-.51	.07	2	0	1.0	1	8.0	---	31	N	20	11	9	11	5.5	83
Dodge City	2594	930.2	1020.5	44	19	31.3	+1.0	65	31	-1	21	0	30	18	66	.20	-.29	.12	3	0	2.3	1	13.4	S	49	NE	20	10	8	13	5.8	64
Goodland	3645	887.6	1018.6	41	17	29.1	+3.3	65	6	-3	21	0	31	19	73	.20	-.11	.12	4	0	2.4	2	10.7	WSW	*35	NNW	2	10	8	13	5.8	--
Topeka	879	984.8	1022.4	39	16	27.6	-1.1	62	8	-5	21	0	31	15	61	.06	-1.01	.03	3	0	.4	T	9.5	NNW	40	N	20	7	10	14	6.3	50
Wichita	1322	971.6	1021.1	42	19	30.7	-1.3	65	7	-1	21	0	30	19	68	.09	-.96	.07	3	0	.8	1	13.7	S	47	N	20	7	9	15	6.2	68
KENTUCKY																																
Lexington	979	985.1	1021.9	44	27	35.3	+2.3	58	°19	-3	12	0	24	28	77	4.16	-.34	1.33	10	1	4.8	4	15.1	SSE	--	---	--	6	6	19	7.4	--
Louisville CO	457	------	------	44	28	36.0	+.4	61	8	6	12	0	22	--	--	4.15	+.08	1.80	10	2	4.4	3	----	---	--	---	--	--	--	--	---	--
Louisville	474	1004.7	1021.4	45	27	36.0	+1.1	60	20	2	°13	0	23	28	74	4.21	+.11	1.55	10	2	5.3	3	9.9	S	34	SW	9	7	5	19	7.2	41
LOUISIANA																																
8aton Houge	64	1018.6	1021.7	66	43	54.3	+1.9	80	20	30	1	0	4	47	78	4.69	-.80	1.72	7	2	.0	0	9.8	SE	--	---	--	6	6	19	6.9	--
Lake Charles	12	1020.3	1021.8	65	46	55.2	+2.6	75	19	30	°11	0	2	49	81	2.26	-2.56	.99	7	2	.0	0	8.5	SE	--	---	--	5	5	21	7.6	--
New Orleans CO	9	1020.0	------	66	48	56.8	+.9	81	20	34	11	0	0	--	--	3.76	-1.02	1.77	9	2	.0	0	6.6	---	22	NW	11	6	6	19	7.1	49
New Orleans	3	1020.0	1022.2	65	46	55.4	+.5	80	20	32	1	0	1	48	78	3.96	-.72	1.48	7	3	.0	0	9.8	S	*29	NW	11	7	9	15	8.6	--
Shreveport	252	1012.2	1021.9	59	39	49.3	+1.5	81	20	19	22	0	7	41	76	3.82	-.90	1.12	9	2	T	T	10.2	S	--	---	--	6	5	20	7.3	36
MAINE																																
Caribou	624	993.9	1018.5	16	-4	6.5	-2.2	38	6	-26	23	0	31	2	79	1.59	-.65	.53	13	0	23.8	16	11.7	NW	*40	NW	17	8	8	15	8.6	--
Portland	61	1014.2	1018.1	27	8	17.9	-2.8	48	21	-19	18	0	31	13	78	2.63	-1.80	.93	11	0	27.4	11	9.8	N	35	NW	8	7	4	20	7.2	48
MARYLAND																																
8altimore CO	14	------	------	44	29	36.7	+.1	73	27	16	23	0	23	--	--	1.84	-1.82	.70	8	--	----	--	----	---	--	---	--	--	--	--	---	--
Baltimore	146	1016.3	1021.0	42	24	33.0	-1.2	70	27	6	18	0	26	23	69	2.02	-1.64	.62	10	1	13.7	6	10.1	WNW	60	W	28	6	9	16	6.5	52
Frederick	294	------	------	39	22	30.6	-2.1	69	27	5	18	0	28	--	--	1.10	-1.78	.35	8	--	11.8	8	----	---	--	---	--	--	--	--	---	--
MASSACHUSETTS																																
8lue Bill Obs.	636	993.5	------	31	15	22.8	-3.1	51	26	-4	18	0	31	--	72	4.06	-.02	.93	16	1	28.1	13	15.8	WNW	44	NW	17	7	8	16	6.9	33
8oston	15	1012.5	1016.9	34	19	26.0	-3.1	53	°26	3	18	0	28	16	67	3.26	-.24	.87	18	1	19.2	11	13.5	NW	43	NW	17	7	4	20	7.2	44
Nantucket	43	1016.9	1017.5	39	25	31.8	-.3	50	°6	9	14	0	27	26	79	5.10	+1.23	1.45	19	1	11.0	6	14.3	WNW	38	NW	17	5	7	19	7.6	38
Pittsfield	1153	973.9	1018.3	28	10	19.0	-2.2	49	°26	-17	18	0	31	--	--	2.93	-.17	.72	16	0	23.4	10	----	---	--	---	--	5	5	21	7.5	--
MICHIGAN																																
Alpena CO	587	997.0	------	26	12	19.2	-2.0	37	2	-1	17	0	31	--	--	1.37	-.29	.37	7	0	17.4	9	10.9	---	38	NW	30	5	7	19	7.5	35
Detroit	619	992.9	1020.4	33	20	26.1	-.1	51	20	6	17	0	29	20	77	1.68	-.40	.66	12	0	6.0	3	11.9	N	37	NW	30	4	5	22	8.0	32
Escanaba CO	594	997.0	------	24	9	16.7	-.8	35	2	-16	17	0	31	--	--	1.22	-.31	.42	17	0	20.9	19	10.8	---	38	N	°2	6	6	19	7.1	41
Grand Rapids	681	993.9	1020.3	31	16	23.5	.0	48	26	-4	28	0	30	20	82	1.69	-.21	.61	11	0	23.7	7	10.8	ESE	29	NE	26	2	6	23	8.6	21
Lansing	859	987.5	1020.8	30	16	23.2	-.6	48	26	-2	28	0	31	18	78	1.61	-.26	.96	10	0	12.1	7	13.2	SSE	47	W	30	3	9	19	8.0	30
Marquette CO	677	992.2	------	23	11	17.3	-1.4	36	24	-11	17	0	31	--	--	1.69	-.48	.32	20	0	19.4	16	9.3	---	29	S	23	4	4	23	8.3	27
Muskegon	627	996.3	1020.3	31	18	23.6	-1.3	44	2	-1	28	0	30	18	75	2.05	+.10	.58	16	0	33.9	10	----	---	--	---	--	3	2	26	8.6	--
Sault Ste. Marie	721	997.3	1021.1	19	3	11.2	-2.6	34	24	-16	°10	0	31	7	82	1.34	-.82	.26	17	0	17.9	21	10.2	E	36	NW	°1	4	4	23	7.9	31
Ypsilanti	722	990.9	1020.2	33	18	25.4	+.1	52	2	3	13	0	30	20	77	1.74	-.06	.73	10	0	5.9	3	10.9	SW	*30	WNW	30	3	5	23	8.2	--
MINNESOTA																																
Duluth	1409	977.3	1021.3	14	-6	3.9	-4.4	32	4	-33	17	0	31	-2	73	1.45	+.22	.36	17	0	23.0	22	13.0	NNW	42	NE	2	6	7	18	7.3	43
Intern'l Falls	1179	975.6	1023.2	7	-16	-4.6	-7.6	26	°3	-41	21	0	31	-12	64	1.39	+.50	.39	20	0	23.1	26	9.2	---	--	---	--	8	7	16	6.8	--
Minneapolis	830	987.1	1022.9	20	1	10.3	-4.3	36	°1	-25	17	0	31	3	72	.25	-.55	.09	8	0	3.6	2	11.4	SSE	37	W	9	5	10	16	6.9	40
Rochester	1017	982.4	1022.0	23	1	11.9	-2.4	38	°1	-25	17	0	31	5	70	.49	-.44	.28	5	0	5.1	3	12.1	NW	--	---	--	5	7	19	7.3	--
St. Cloud	1034	981.7	1022.4	15	-8	3.5	-7.0	36	4	-33	17	0	31	-3	71	.49	-.26	.10	8	0	7.8	11	7.4	NW	--	---	--	9	4	[illegible]	6.8	--
MISSISSIPPI																																
Jackson	315	1009.8	1022.1	60	39	49.6	+1.3	77	20	26	°13	0	9	40	75	4.87	-.22	1.70	8	2	T	T	9.6	S	42	SW	20	9	2	20	7.1	40
Meridian	294	1008.8	------	61	37	48.6	+1.1	76	20	25	°12	0	13	--	--	4.11	-.98	1.40	9	3	.0	0	----	---	--	---	--	8	6	17	6.4	--
Vicksburg CO	234	1012.5	------	60	41	50.8	+1.6	77	20	26	°13	0	7	--	--	4.65	-.79	1.41	11	2	T	0	9.6	---	34	N	10	4	6	21	7.6	33
MISSOURI																																
Columbia	778	991.9	1021.5	40	21	30.3	+.5	63	8	1	12	0	28	20	67	1.01	-.79	.52	5	2	1.5	2	10.5	S	33	NW	15	10	5	16	6.4	56
Kansas City	741	985.8	1022.2	39	19	29.3	-.7	62	8	-3	21	0	29	17	64	.05	-1.38	.03	3	1	1.1	1	9.4	NW	38	S	18	8	8	15	6.2	48
St. Joseph	809	985.4	1022.1	37	14	25.4	-1.7	59	29	-7	21	0	31	13	61	.07	-1.08	.03	5	1	.4	T	11.5	---	43	N	20	8	11	12	8.1	58
St. Louis CO	465	1000.7	------	43	25	33.9	+.6	65	8	5	12	0	24	--	--	1.51	-.81	.85	5	2	.5	T	12.2	---	35	S	23	9	7	15	6.4	50
St. Louis	552	1000.7	1021.8	42	23	32.7	+.5	64	8	3	12	0	26	23	70	1.23	-.69	.63	5	2	.5	T	10.2	S	--	---	--	10	4	17	6.6	--
Springfield	1265	971.9	1021.1	44	23	33.8	+1.1	68	7	5	12	0	27	24	72	1.64	-.67	.75	12	3	2.8	2	13.8	SSE	40	W	°4	8	4	19	6.8	43
MONTANA																																
Billings	3568	889.3	1018.7	29	6	17.5	-5.4	60	7	-27	20	0	28	6	63	1.24	+.71	.60	10	0	20.2	12	11.2	SW	48	NW	3	4	8	19	7.7	50
Glasgow CO	2090	942.8	1022.7	11	-9	1.0	-9.7	47	6	-49	20	0	31	-7	66	1.20	+.80	.37	12	0	20.1	13	----	---	--	---	--	3	5	23	8.1	--
Great Falls	3664	885.9	1019.6	20	1	10.2	-12.5	55	6	-33	20	0	29	1	70	1.23	+.68	.47	11	0	15.5	11	13.7	SW	59	SW	°1	6	4	21	7.7	39
8avre CO	2488	926.9	1022.0	13	-6	3.3	-12.9	53	5	-43	20	0	28	--	--	.82	+.36	.24	10	0	14.0	11	7.3	---	38	SW	3	6	5	20	7.5	33
8elena	3893	870.3	1019.1	27	5	16.2	-1.4	54	22	-36	20	0	31	6	66	1.26	+.75	.44	10	0	24.2	13	7.8	W	48	SW	1	5	6	20	7.7	42
Kalispell	2965	------	------	29	14	21.1	+.8	47	6	-22	20	0	30	--	--	2.74	+1.42	.58	17	0	32.8	16	----	---	--	---	--	1	5	25	8.9	--
Miles City	2629	949.9	1021.6	21	-2	9.8	-6.3	53	6	-36	20	0	30	5	--	.47	.00	.31	6	0	7.4	7	10.2	NE	--	---	--	5	8	18	7.3	--
Missoula	3200	898.7	1017.0	31	16	23.4	+4.0	45	7	-12	20	0	31	18	79	2.21	+1.40	.71	20	0	24.2	14	6.2	E	35	E	15	1	5	25	8.8	22
NEBRASKA																																
Grand Island	1841	952.3	1021.8	33	10	21.3	-1.7	56	31	-12	21	0	31	11	68	.27	-.31	.18	3	0	2.8	2	11.7	N	--	---	--	7	7	17	6.7	--
Lincoln CO	1184	------	------	34	10	22.0	-3.0	58	31	-12	21	0	31	--	--	.15	-.87	.07	4	0	1.8	1	9.3	---	39	NW	2	--	--	--	---	59
Lincoln	1180	------	------	34	8	20.6	-3.4	59	31	-12	21	0	31	7	--	.12	-.59	.03	4	0	1.8	1	11.3	N	--	---	--	6	11	14	6.4	--
Norfolk	1544	964.1	1022.8	29	5	16.9	-2.4	55	°1	-17	21	0	31	7	65	.15	-.64	.09	2	0	2.1	1	----	---	--	---	--	7	7	17	6.9	--
North Platte	2779	916.7	1020.0	37	12	24.5	+.5	63	31	-6	20	0	31	14	70	.10	-.29	.04	3	0	1.8	1	10.2	SSE	42	N	20	7	8	16	8.3	55
Omaha	978	980.7	1022.9	32	7	19.6	-3.4	55	°1	-14	21	0	31	10	68	.24	-.61	.14	4	0	2.8	2	13.2	NNW	47	N	20	5	14	12	6.2	62
Scottsbluff	3950	853.0	1017.9	44	14	29.1	+5.6	65	6	-8	20	0	31	13	55	.02	-.31	.02	1	0	.5	T	10.4	WNW	--	---	--	6	6	19	7.1	--
Valentine CO	2581	924.1	------	36	10	22.6	+1.5	63	6	-17	20	0	31	--	--	.05	-.51	.04	2	0	.9	1	8.7	---	29	NW	2	5	11	15	8.7	63
NEVADA																																
Elko	5075	843.9	1019.3	38	13	25.6	+3.7	48	16	-13	26	0	30	18	75	.65	-.42	.45	4	0	6.7	5	5.3	SW	*36	WNW	3	3	5	23	8.3	--
Ely	6257	807.3	1020.7	41	13	27.2	+4.2	57	5	-5	25	0	31	16	64	.94	.00	.67	4	0	10.9	6	12.9	---	37	S	17	5	7	19	7.3	56
Las Vegas	2162	950.9	1017.2	58	33	45.3	+1.1	73	31	21	°1	0	13	25	49	.91	+.47	.88	2	0	.0	0	5.3	W	*33	NNW	25	7	7	17	8.5	80
Reno	4397	860.8	1017.3	49	22	35.3	+4.1	64	6	8	9	0	25	21	59	.86	-.18	.34	4	0	3.7	3	10.0	S	86	SW	17	6	7	18	6.7	57
Winnemucca	4299	866.9	1017.6	46	22	33.8	+6.0	58	°16	3	°9	0	27	23	65	.33	-.83	.20	4	0	1.9	2	9.5	---	38	W	°15	2	6	23	8.2	40
NEW HAMPS8IRE																																
Concord	339	1007.5	1018.6	29	9	18.6	-1.5	51	21	-16	14	0	31	11	73	2.35	-.56	.73	14	0	20.2	10	7.4	NW	34	W	17	8	5	18	6.9	37
Mt. Washington	6262	795.3	1015.9	16	3	6.2	+.8	36	20	-32	18	0	31	--	74	6.89	+1.79	1.10	24	1	36.9	14	38.8	W	†139	NW	8	7	4	20	7.2	35

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
NEW JERSEY																																
Atlantic City CO	8	1017.6	1019.6	42	28	34.9	-0.9	58	21	11	18	0	20	--	--	3.04	-0.74	1.03	13	1	11.8	8	16.6	---	44	NW	28	9	7	15	6.6	50
Newark	11	1018.6	1019.8	37	22	29.7	-1.8	56	26	5	18	0	27	20	70	1.36	-2.24	.57	12	2	10.6	8	11.2	NNE	*38	WNW	12	8	6	17	6.8	--
Trenton CO	56	1012.9	1020.0	39	23	30.9	-1.7	60	27	7	18	0	24	--	--	1.68	-1.48	.79	11	1	9.9	8	9.2	---	*40	NW	28	6	8	17	7.1	48
NEW MEXICO																																
Albuquerque	5310	850.3	1019.1	50	27	38.4	+4.7	62	°29	15	1	0	24	21	53	.20	-.08	.11	4	1	2.9	2	6.6	N	40	E	12	9	11	11	5.4	67
Clayton	4969	844.2	1017.3	52	22	37.1	+4.2	73	7	1	21	0	29	--	--	.30	+.03	.12	5	0	3.0	2	----	---	--	---	--	15	4	12	5.0	--
Roswell	3612	894.7	1018.5	60	25	42.3	+2.7	77	29	10	11	0	25	19	46	.21	-.21	.14	2	0	2.4	2	7.9	---	57	NW	15	15	6	10	4.9	--
NEW YORK																																
Albany	277	1015.2	1019.9	28	9	18.5	-4.0	48	26	-18	14	0	29	12	74	2.71	+.44	.84	14	1	28.8	12	10.1	N	40	W	1	5	5	21	7.5	36
Binghamton	1601	957.3	1018.8	28	11	19.8	-1.9	48	26	-5	°18	0	30	14	80	2.50	+.12	.91	15	1	18.1	6	14.1	WNW	40	W	30	1	5	25	8.3	33
Huffalo	693	991.2	1020.1	31	16	23.4	-2.0	52	°26	1	17	0	28	17	76	2.94	+.16	.81	17	0	16.2	3	13.6	WSW	43	SW	24	1	8	22	8.3	33
New York CO	10	1007.5	------	39	24	31.4	-1.5	57	27	9	°18	0	26	--	--	1.77	-1.69	.84	11	1	13.3	10	13.5	---	51	NW	1	8	8	15	6.7	48
New York	19	1018.0	1019.9	39	24	31.5	-1.5	57	26	9	18	0	25	20	65	1.91	-1.28	.64	13	1	13.1	9	12.5	NW	50	NW	°12	5	9	17	6.9	--
Rochester	543	1000.0	1020.1	31	15	22.6	-2.1	51	20	-1	°29	0	28	18	82	1.53	-.83	.49	18	0	19.8	5	11.3	NW	38	W	1	2	8	21	8.3	32
Schenectady	217	------	------	29	12	20.7	-.8	46	°26	-15	14	0	29	--	--	2.73	+.31	.91	14	1	25.2	11	----	---	--	---	--	7	11	13	6.4	--
Syracuse	424	997.6	1020.8	29	11	20.4	-5.1	54	26	-7	14	0	28	13	72	2.43	-.36	.48	20	0	22.3	8	8.8	NW	45	NW	1	4	6	21	7.8	44
NORTH CAROLINA																																
Asheville CO	2203	------	------	51	30	40.4	+1.0	67	26	8	13	0	21	--	--	6.31	+3.33	2.42	11	2	3.6	3	9.0	---	32	NW	12	10	9	12	5.8	50
Asheville	2093	945.8	1022.1	--	--	----	----	--	--	--	--	--	--	31	77	----	-----	----	--	--	----	--	5.0	NNW	--	---	--	--	--	--	---	--
Charlotte	753	993.2	1021.9	54	33	43.2	+.9	72	27	15	13	0	19	32	71	6.28	+2.60	2.28	8	2	3.5	2	6.5	S	26	NW	°12	11	4	16	6.4	53
Greensboro	891	989.8	1022.6	50	28	39.0	.0	67	27	12	13	0	24	29	73	6.19	+2.82	2.16	10	2	8.0	6	8.8	SW	30	NW	12	9	8	14	6.1	47
Hatteras	4	1020.7	1021.2	55	40	47.4	-.6	66	20	25	13	0	4	41	79	5.67	+1.57	2.83	9	2	.0	0	13.1	NNW	50	NW	23	10	7	14	5.6	47
Raleigb CO	400	------	------	53	32	42.7	.0	71	27	14	13	0	19	--	--	8.43	+5.18	3.34	9	2	6.0	5	6.6	---	26	W	27	10	9	12	6.0	52
Raleigh	438	1005.8	1022.0	52	31	41.6	+.2	70	27	13	13	0	21	31	72	7.52	+3.99	2.79	10	0	6.5	5	7.4	SW	--	---	--	10	9	12	5.9	--
Wilmington	30	1020.7	1022.1	59	38	48.5	+.7	78	21	20	13	0	8	--	--	3.34	+.22	1.23	9	3	T	0	9.0	---	31	N	23	10	8	13	5.6	60
Winston-Salem	967	985.4	1021.7	50	30	40.1	+.8	69	27	12	13	0	21	28	67	6.81	+3.12	2.67	9	1	9.1	8	8.8	SW	*30	NE	10	9	8	14	6.0	--
NORTH DAKOTA																																
Bismarck	1650	958.3	1023.5	13	-12	.6	-9.1	46	6	-37	21	0	31	-5	73	.52	+.16	.12	9	0	7.9	5	10.3	NW	38	N	29	6	7	18	7.2	47
Devils Lake CO	1471	931.6	------	5	-15	-5.1	-9.9	35	31	-36	21	0	31	--	--	1.31	+.91	.28	11	0	19.4	18	8.1	---	27	NW	5	7	7	17	6.9	50
Fargo	895	986.5	1023.8	9	-12	-1.4	-8.5	36	31	-30	21	0	31	-10	69	.47	-.13	.12	9	0	7.0	12	15.3	NNW	47	NW	9	5	8	18	7,0	43
Williston CO	1877	950.2	1022.8	9	-11	-.6	-10.6	42	3	-39	21	0	31	-6	72	1.27	+.78	.52	11	0	17.0	12	6.2	---	22	W	4	4	6	21	7.9	50
OHIO																																
Akron	1210	981.4	1020.9	36	20	27.7	+.3	55	20	3	13	0	27	22	80	2.87	+.13	1.19	20	1	7.3	2	11.4	NW	--	---	--	2	5	24	8.4	--
Cincinnati Obs.	761	------	------	43	27	35.2	+2.1	61	20	6	12	0	22	--	--	2.34	-1.10	1.00	14	2	3.2	2	8.1	---	26	SW	27	--	--	--	---	36
Cincinnati	869	988.5	1021.4	42	26	34.2	+2.4	60	20	5	13	0	23	26	74	2.54	-.86	1.14	11	1	3.0	2	11.7	SSW	*30	SSW	20	6	6	19	7.6	--
Cleveland CO	663	------	------	37	23	29.8	+.3	58	20	6	13	0	26	--	--	2.34	-.11	.96	17	--	----	--	----	---	--	---	--	--	--	--	---	--
Cleveland	787	991.9	1020.4	36	21	28.5	.0	57	20	2	11	0	28	23	77	3.12	+.74	1.22	22	0	13.2	6	13.0	WNW	38	SW	27	0	7	24	8.7	24
Columbus CO	724	------	------	41	28	34.3	+3.2	58	20	7	13	0	22	--	--	2.32	-.49	.98	8	--	4.3	2	----	---	--	---	--	--	--	--	---	--
Columbus	815	990.2	1021.3	40	24	31.8	+2.1	57	20	5	13	0	28	25	77	2.92	-.02	1.44	9	1	4.5	2	10.4	SSW	31	W	27	5	4	22	8.1	38
Dayton	1002	983.7	1021.2	39	24	31.4	+1.7	56	20	4	13	0	25	25	78	2.53	-.43	1.05	9	0	4.9	2	11.8	SSW	43	W	27	4	8	19	7.7	42
Portsmouth CO	715	------	------	46	28	36.8	+3.7	62	20	3	13	0	24	--	--	2.90	-.56	1.34	14	1	8.8	4	7.7	---	43	S	20	--	--	--	---	--
Sandusky	603	997.0	------	36	23	29.5	+.7	56	20	4	13	0	27	--	--	2.55	+.26	1.13	13	0	4.5	2	9.4	---	38	NW	27	5	3	23	7.9	30
Toledo	622	996.6	1020.7	35	19	27.0	+.6	55	20	1	13	0	29	22	78	2.21	-.04	.95	12	0	4.9	3	13.7	WSW	34	SW	2	2	3	26	8.5	26
Youngstown	1178	976.3	1020.5	36	18	26.7	-.8	57	20	0	°18	0	29	20	77	2.83	-.49	1.13	20	1	9.5	3	11.5	WNW	*35	WSW	27	3	7	21	8.2	--
OKLAHOMA																																
Oklahoma City	1280	976.0	1020.9	50	26	38.0	+.9	70	8	3	21	0	23	26	65	.43	-1.07	.22	5	1	5.0	3	17.0	S	59	N	20	11	8	12	5.8	56
Tulsa	672	995.6	1021.0	48	26	37.0	-.4	70	°7	5	22	0	20	25	65	.93	-1.05	.53	6	1	6.0	4	12.8	S	35	S	23	10	4	17	6.5	44
OREGON																																
Astoria	12	1012.2	1013.1	46	35	40.3	+.2	56	31	24	20	0	8	37	88	18.94	+9.83	3.55	25	3	6.4	2	8.4	E	--	---	--	2	2	27	9.0	--
8urns CO	4140	870.0	1015.4	39	23	31.1	+7.2	50	28	3	25	0	28	24	75	1.05	-.42	.24	12	0	10.2	3	----	---	--	---	--	3	6	22	8.2	--
Eugene	361	1001.0	1014.7	47	35	40.6	+2.4	62	5	20	20	0	13	36	84	12.43	+7.02	2.66	23	0	10.5	3	11.2	S	*40	S	°2	1	5	25	8.6	--
Meacham	4050	------	------	35	22	28.7	+3.8	48	30	-4	20	0	27	--	--	1.95	-2.35	.33	20	0	19.7	19	----	---	--	---	--	2	2	27	9.0	--
Medford	1312	968.2	1016.7	46	32	39.1	+1.9	58	6	22	25	0	16	35	89	6.18	+3.67	1.07	23	0	4.0	1	2.9	S	*27	SE	6	1	2	28	9.1	--
Pendleton	1489	960.4	1015.1	42	27	34.5	+3.9	59	5	-8	20	0	19	25	71	1.30	-.18	.31	15	0	6.7	5	9.1	S	--	---	--	3	3	25	8.7	--
Portland	22	1008.8	1014.5	44	34	39.0	+1.6	58	5	19	20	0	12	34	85	8.95	+4.36	1.81	21	0	10.6	6	11.2	ESE	47	SW	°2	0	5	26	9.0	21
Roseburg	505	996.6	1015.6	49	34	41.5	----	65	5	22	25	0	13	--	--	9.77	+5.17	1.60	23	0	13.3	2	5.3	---	26	S	2	1	6	24	8.7	26
Salem	195	1006.8	1014.1	46	34	40.2	+1.8	59	5	18	20	0	13	36	85	9.99	+4.27	2.14	22	0	7.6	5	10.4	S	--	---	--	1	6	24	8.6	--
Sexton Summit CO	3836	------	------	37	29	33.1	-2.7	52	31	18	25	0	25	--	--	10.46	+6.44	1.89	23	0	67.8	42	----	---	--	---	--	2	6	23	8.5	--
PENNSYLVANIA																																
Allentown	381	1005.1	1020.4	35	18	26.1	-2.4	52	27	-10	18	0	29	18	73	2.06	-1.15	.69	12	1	13.2	7	10.6	W	--	---	--	5	9	17	7.2	--
Harrisburg	335	1006.8	1021.0	37	22	29.5	-1.6	66	27	4	18	0	29	17	63	1.47	-1.15	.64	13	0	12.0	7	8.1	WNW	40	NW	28	5	8	18	7.1	37
Park Place CO	1932	------	------	30	13	21.6	-2.2	49	26	-1	17	0	30	--	--	1.46	-1.48	.48	14	0	13.3	10	----	---	--	---	--	6	2	23	7.8	--
Philadelphia CO	26	------	------	41	26	33.4	-1.5	62	27	13	18	0	24	--	--	2.04	-1.35	.84	11	1	12.5	10	8.8	---	25	NW	12	5	8	18	7.2	45
Philadelphia	13	1015.9	1020.2	40	23	31.7	-1.5	63	27	5	°18	0	25	20	62	1.93	-1.44	.97	13	1	13.3	9	10.2	WNW	*35	NW	°28	6	5	20	7.3	--
Pittsburgh CO	749	------	------	41	25	33.0	.0	63	20	11	°18	0	24	--	--	1.95	-.88	.49	15	--	6.4	--	----	---	--	---	--	--	--	--	---	23
Pittsburgh	1151	989.5	1020.4	38	21	29.6	+.6	60	20	5	18	0	27	22	71	2.34	-.43	.54	17	0	6.7	3	11.9	WSW	*38	SW	20	3	6	22	8.1	37
Reading CO	266	1008.1	1020.7	38	23	30.6	-1.6	65	27	3	18	0	26	--	--	1.61	-1.54	.69	11	0	12.3	8	11.0	---	47	NW	28	5	9	17	7.1	40
Scranton CO	746	990.2	1020.7	34	18	25.8	-2.4	59	27	-6	18	0	28	--	--	1.57	-.69	.39	11	1	11.1	8	6.1	---	33	NW	28	4	7	20	7.6	30
Williamsport	527	1000.7	1020.4	34	18	25.9	-2.6	57	27	-5	18	0	30	16	68	2.30	-.29	.70	16	1	10.9	5	8.3	E	*52	WNW	27	3	7	21	8.0	--
RHODE I5LAND																																
8lock Island	110	1013.5	1018.0	38	24	31.0	-.9	53	3	6	18	0	25	--	--	3.17	-.50	.69	16	1	9.6	6	----	---	--	---	--	4	9	18	7.5	--
Providence	55	1012.2	1018.5	35	17	25.9	-2.8	54	21	-8	18	0	29	17	68	2.84	-.91	.78	17	1	17.0	11	11.9	NNE	*32	SSW	30	6	5	20	7.0	41
SOUTR CAROLINA																																
Charleston CO	9	1020.0	------	62	44	52.9	+1.5	78	21	25	13	0	1	--	--	1.31	-1.17	.59	8	1	.0	0	9.1	---	32	SW	11	7	9	15	6.1	57
Charleston	41	1020.3	1021.9	64	39	51.5	+1.2	80	21	24	13	0	9	42	76	.89	-1.59	.39	8	1	.0	0	9.1	SSW	--	---	--	7	8	16	6.4	--
Columbia CO	332	1008.8	------	59	39	48.8	+.9	73	21	23	13	0	5	--	--	1.76	-1.08	.85	6	0	.0	0	----	---	--	---	--	11	6	14	6.3	--
Columbia	217	1013.5	1022.0	60	35	47.3	+.3	76	21	22	13	0	16	37	74	1.91	-1.23	.65	7	0	T	0	6.0	SSW	--	---	--	9	7	15	6.2	63
Florence	146	1016.3	1021.7	60	36	48.4	+2.1	76	21	20	13	0	11	--	--	2.39	-.46	.88	5	1	T	0	----	---	--	---	--	9	8	14	6.2	--
Greenville	1018	984.1	1021.6	54	34	44.2	+.9	73	27	16	13	0	13	32	69	7.35	+2.89	3.08	10	2	T	0	8.2	SW	61	NE	22	9	14	8	5.9	58
Spartanburg	801	------	------	54	34	43.8	+.4	74	27	17	13	0	14	--	--	6.82	+2.31	2.96	9	1	T	T	----	---	--	---	--	12	4	15	5.7	--
SOUTR DAKOTA																																
Huron	1282	972.6	1022.8	19	-3	7.8	-5.7	36	°1	-30	21	0	31	3	81	.16	-.41	.08	6	0	2.3	3	11.4	SSE	38	SW	3	6	6	19	7.4	48
Rapid City	3165	900.4	1019.4	34	6	20.1	-1.0	64	6	-17	20	0	31	8	62	.18	-.30	.11	4	0	1.9	2	10.0	NNW	51	NW	15	4	11	16	7.1	50
Sioux Falls	1420	967.8	1022.6	21	-1	10.2	-4.0	44	1	-26	21	0	31	0	64	.16	-.56	.08	4	0	1.9	3	12.2	NNW	*39	N	15	6	6	19	7.1	--
TENNES5EE																																
8ristol	1519	966.1	------	49	27	37.9	-.7	64	27	5	13	0	25	--	--	6.60	+3.10	2.18	11	0	2.6	1	----	---	--	---	--	8	4	19	6.9	--
Chattanooga	670	994.6	1021.3	53	32	42.0	+.4	64	27	14	13	0	17	33	74	10.47	+5.24	3.34	13	3	.1	T	6.1	SSW	28	NW	16	8	8	15	6.6	45
Knoxville	950	986.5	1022.6	50	30	39.8	-.7	64	27	11	13	0	20	32	75	11.74	+7.20	3.79	11	3	2.1	2	7.2	NE	30	N	20	8	6	17	6.6	49
Memphis CO	271	------	------	50	35	42.3	+.4	71	20	17	12	0	11	--	--	9.16	+3.78	3.37	10	--	4.4	3	----	---	--	---	--	--	--	--	---	--
Memphis	263	1007.1	1022.1	51	35	42.8	+1.2	73	20	19	13	0	15	35	75	10.79	+5.24	3.87	10	3	3.8	3	9.1	S	37	SW	20	7	6	18	6.9	38
Nashville	577	1002.0	1022.5	50	31	40.1	+.2	63	°19	11	°13	0	18	33	78	7.65	+2.72	2.10	10	2	.2	T	9.2	SSE	26	NW	3	8	3	20	7.2	51

See footnotes at end of table.

Table 2—Continued

State and station		Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)				
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
	Elevation (ground)	Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F	°F	°F.	°F.	°F.		°F.				°F	%	In.	In.	In.			In.	In.	M p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
TENNESSEE (Cont.)																																
Oak Ridge	905	987.5	------	49	30	39.2	+0.4	61	26	11	13	0	22	--	--	13.27	+8.20	4.25	13	1	T	T	4.8	---	20	SW	27	8	7	16	6.6	--
TEXAS																																
Abilene	1759	957.0	1019.7	58	34	46.1	+2.8	76	25	14	21	0	14	33	65	.93	+.05	.65	4	2	1.5	2	12.9	S	38	S	7	12	5	14	5.6	52
Amarillo	3590	889.9	1018.1	55	25	39.8	+4.5	76	7	4	21	0	25	18	50	.25	-.39	.15	4	0	3.1	2	12.3	SW	41	NE	20	15	3	13	5.2	77
Austin	615	999.0	1021.3	62	42	52.0	+2.1	82	20	23	22	0	7	44	76	1.01	-1.62	.55	11	2	T	T	10.1	S	35	NE	20	6	7	18	6.8	44
Brownsville	16	1016.6	1019.3	75	55	65.2	+4.7	82	27	35	22	0	0	57	80	.27	-1.28	.13	6	0	.0	0	12.9	SE	33	SE	19	8	8	15	6.3	51
Corpus Christi	40	1019.3	1020.5	70	51	60.3	+4.4	82	20	29	°11	0	2	55	84	.35	-1.04	.23	5	0	T	T	12.9	SSE	37	SE	19	7	3	21	7.1	43
Dallas	487	1002.4	1021.6	57	36	46.1	+.4	74	20	13	22	0	12	39	78	3.03	+.56	1.18	11	3	1.4	1	8.9	S	36	SW	8	7	7	17	6.7	41
Del Rio	1091	985.1	1019.8	65	43	53.8	+1.9	79	26	24	22	0	3	41	69	.10	-.73	.02	8	0	.0	0	6.1	SE	35	NW	21	8	7	16	6.5	47
El Paso	3920	888.3	1018.1	61	33	47.0	+3.6	72	29	19	°1	0	16	23	41	.10	-.32	.09	2	0	T	T	10.0	NNE	52	NW	20	11	11	9	5.0	84
Fort Worth	544	1000.3	1021.7	56	35	45.6	+.3	74	8	13	22	0	12	36	74	2.08	-.34	.86	10	3	1.3	1	11.7	S	•30	NNW	20	9	5	17	6.7	--
Galveston CO	7	- ----	------	63	51	56.9	+2.4	71	°2	29	22	0	3	--	--	1.39	-2.70	.71	7	--	.0	0	13.0	---	35	NW	10	--	--	--	---	35
Galveston	5	1019.0	1021.5	63	50	56.4	+2.1	72	15	28	22	0	3	52	87	1.27	-3.07	.60	6	2	.0	0	12.2	SSE	--	---	--	6	6	19	7.2	--
Houston CO	41	1016.3	------	66	49	57.1	+3.3	78	20	24	22	0	5	--	--	2.55	-1.43	.97	11	1	.0	0	10.6	---	31	NW	10	8	3	20	7.5	33
Houston	50	1018.6	1021.6	66	47	56.4	+3.1	76	20	25	22	0	5	49	80	1.65	-2.51	.46	11	2	.0	0	12.3	SE	--	---	--	7	3	21	7.4	--
Laredo	500	1004.1	1019.2	72	49	60.4	+2.8	90	20	34	°11	1	0	49	70	.27	-.75	.17	5	0	.0	0	11.8	SSE	•25	NE	31	9	2	20	6.4	--
Lubbock	3243	904.8	1018.6	58	25	41.6	+2.8	75	25	9	22	0	26	23	55	.06	-.61	.06	1	0	1.0	1	12.8	SW	•32	N	20	14	7	10	4.8	--
Midland	2854	918.4	1018.7	61	33	47.1	----	76	8	18	21	0	14	28	56	.26	-----	.20	3	0	T	T	6.4	SSW	•28	NNE	20	16	5	10	4.4	--
Port Arthur	16	1016.3	1021.7	65	46	55.3	+2.4	74	°19	26	22	0	3	50	87	2.94	-2.18	1.65	7	3	T	T	12.5	SE	35	NW	10	6	5	20	7.4	32
San Angelo	1903	951.6	1019.9	61	36	48.5	+1.0	79	26	18	11	0	12	35	63	.51	-.48	.28	4	1	2.5	T	----	---	--	---	--	13	6	12	5.3	--
San Antonio	792	994.9	1020.4	65	44	54.9	+4.3	80	20	27	11	0	6	44	72	.51	-1.30	.24	10	1	T	T	7.7	NE	37	NE	21	7	8	16	6.4	49
Victoria	110	1015.2	1020.6	69	47	57.9	+2.7	80	°4	26	22	0	4	49	75	.84	-1.88	.71	9	1	.0	0	9.9	---	†42	NNW	10	7	6	18	6.9	--
Waco	500	1002.4	1021.1	59	38	48.5	+1.2	79	20	19	22	0	9	41	77	.79	-1.59	.27	5	2	T	T	10.8	S	--	---	--	8	3	20	6.9	--
Wichita Falls	1027	982.7	1020.6	55	32	43.2	+2.6	77	8	12	21	0	16	29	62	.69	-.62	.29	7	0	2.0	1	10.2	S	•30	NNW	20	13	7	11	5.2	--
UTAH																																
Milford	5028	846.6	1020.0	43	19	30.9	+7.1	56	7	5	10	0	29	--	--	1.53	+.96	.87	4	0	9.2	5	----	---	--	---	--	5	6	20	7.2	--
Salt Lake City	4222	867.3	1018.6	43	25	34.0	+7.5	52	17	7	26	0	26	24	70	.90	-.30	.66	5	0	10.6	6	10.3	S	38	SE	23	3	6	22	8.0	41
VERMONT																																
Burlington	331	1004.4	1020.1	23	3	12.8	-5.1	47	21	-22	18	0	30	7	77	2.12	+.23	.70	17	0	33.0	13	11.5	S	32	S	°20	6	4	21	7.3	46
VIRGINIA																																
Lynchburg	947	986.5	1021.3	47	27	37.2	-.5	70	27	9	13	0	26	27	69	3.84	+.41	1.60	9	0	4.6	4	9.8	SSW	32	NW	28	8	8	15	6.3	51
Norfolk	26	1020.0	1021.3	51	33	41.7	+.2	71	27	20	°14	0	17	32	72	6.40	+3.23	2.26	8	0	1.6	1	10.3	S	38	NE	22	10	12	9	6.0	59
Richmond	162	1015.2	1021.6	48	28	38.0	-.3	72	27	10	13	0	23	28	70	3.70	+.16	1.69	9	0	7.5	5	8.4	S	26	NW	°28	7	11	13	6.5	47
Roanoke	1174	978.0	1021.5	48	27	37.4	-.5	69	27	12	13	0	25	25	65	4.77	+1.38	2.01	9	0	8.4	4	9.6	WNW	--	---	--	7	8	16	6.4	--
WASHINGTON																																
Olympia	190	1004.7	1012.7	42	30	35.6	-1.4	61	31	7	20	0	19	33	87	11.96	+5.27	2.14	26	0	22.9	9	7.2	SSW	•39	S	2	1	3	27	8.8	--
Seattle CO	14	------	------	43	35	39.1	-1.6	56	31	22	20	0	9	--	--	8.64	+4.15	2.19	24	0	16.9	9	12.6	---	45	S	25	2	5	24	8.6	21
Seattle	14	1011.5	1012.7	--	--	----	----	--	--	--	--	--	--	33	82	-----	-----	----	--	--	----	--	8.7	SSE	--	---	--	--	--	--	---	--
Seattle-Tacoma	379	998.3	1013.0	41	31	36.1	-1.1	55	31	16	20	0	16	33	87	8.36	+3.63	1.83	26	0	20.0	10	12.0	SSW	--	---	--	2	2	27	8.9	--
Spokane	2357	943.8	1014.5	32	21	26.9	+2.0	49	6	-9	20	0	28	22	80	4.90	+3.18	1.48	20	0	46.5	17	9.6	NE	42	S	14	1	5	25	8.7	18
Tatoosh CO	101	1007.1	1010.4	43	35	39.3	-2.7	51	5	23	15	0	10	35	83	12.44	+2.25	2.53	24	1	12.0	7	20.8	E	70	S	3	3	2	26	8.4	17
Walla Walla CO	949	978.7	1015.6	41	29	34.8	+2.8	62	6	-6	20	0	16	--	--	2.21	+.53	.59	17	0	7.5	5	6.6	---	27	SW	°1	2	6	23	8.4	18
Walla Walla	1200	------	------	--	--	----	----	--	--	---	--	--	--	27	--	-----	-----	----	--	--	----	--	8.9	S	--	---	--	--	--	--	---	--
Yakima	1061	974.9	1015.0	38	19	28.2	+1.3	56	5	-19	20	0	26	21	75	1.98	+1.02	.69	11	0	21.8	16	7.1	W	--	---	--	1	8	22	8.5	--
WEST VIRGINIA																																
Charleston	950	985.8	1021.4	47	29	38.0	+1.6	66	20	6	13	0	21	28	71	3.63	-.36	1.13	15	0	15.6	8	9.3	S	•27	W	27	2	8	21	7.9	--
Elkins	1970	949.5	1021.5	43	21	31.5	-.7	67	26	-6	18	0	27	25	--	3.57	+.35	.82	17	1	22.2	8	6.1	WNW	41	W	27	4	5	22	7.8	32
Huntington	565	------	------	47	29	38.2	+.2	66	19	3	13	0	23	--	--	2.71	-.90	.82	14	--	10.9	7	----	---	--	---	--	--	--	--	---	--
Parkersburg CO	615	------	------	44	27	35.1	+.7	61	°27	4	13	0	25	--	--	2.31	-.86	.48	15	1	10.2	4	6.9	---	26	NW	30	4	7	20	7.6	29
Parkersburg	837	------	1021.0	--	--	----	----	--	--	--	--	--	--	26	--	-----	-----	----	--	--	----	--	7.9	SW	--	---	--	--	--	--	---	--
Petersburg	1013	------	------	44	21	32.1	-1.7	69	26	0	23	0	28	--	--	1.33	-.65	.78	7	0	10.3	8	----	---	--	---	--	5	7	19	6.9	--
WISCONSIN																																
Green Bay	689	997.0	1021.0	25	6	15.8	-.3	37	2	-19	17	0	31	9	71	.43	-.86	.12	15	0	5.0	2	8.8	N	33	N	9	7	5	19	7.1	37
La Crosse	652	995.6	1021.7	26	5	15.5	-.2	40	5	-20	17	0	31	7	70	.56	-.66	.35	7	0	7.7	6	9.6	NW	•26	NNW	20	3	7	21	7.7	--
Madison	857	983.7	1021.0	30	10	19.8	+.7	43	°1	-14	17	0	31	12	70	.76	-.55	.53	7	0	8.0	6	10.7	NW	35	W	9	6	4	21	7.2	46
Milwaukee	675	994.6	1020.7	31	15	23.0	+1.1	43	2	-13	17	0	30	15	72	.92	-.66	.43	10	0	6.7	5	12.7	WNW	32	SE	8	3	7	21	7.8	45
WYOMING																																
Casper	5322	833.4	1015.1	38	16	27.1	+4.8	52	6	-11	20	0	26	16	61	.45	-.24	.34	5	0	9.6	5	19.0	SSW	--	---	--	3	7	21	8.0	--
Cheyenne	6139	808.0	1015.6	44	21	32.3	+6.8	63	31	-8	20	0	26	14	50	.21	-.35	.08	5	0	2.9	1	14.7	WSW	66	W	18	6	12	13	6.5	64
Lander	5563	831.7	1016.3	39	15	27.1	+10.3	52	22	-5	20	0	31	15	62	.46	-.04	.41	2	0	6.7	6	8.2	---	59	SW	3	3	9	19	7.2	64
Rock Springs	6741	791.4	1019.5	37	17	26.7	+8.7	48	5	-3	20	0	31	16	--	.22	-.24	.21	2	0	3.8	3	13.0	WSW	•40	W	°1	5	5	21	7.6	--
Sheridan	3942	881.8	1019.0	33	5	18.8	-1.3	55	28	-24	20	0	31	10	70	.53	-.22	.21	9	0	10.9	4	7.9	NNW	52	SW	3	3	7	21	7.6	49
PACIFIC AREA																																
Canton Island	9	1007.1	1007.6	90	77	83.8	+.8	92	°5	74	19	21	0	74	76	.43	-.65	.22	7	0	.0	0	----	---	--	---	--	5	15	11	5.9	--
Hilo	28	1012.5	1014.4	79	63	70.6	+.2	87	31	57	29	0	0	62	78	5.73	-8.40	2.06	14	0	.0	0	5.6	SW	•31	SE	18	7	12	12	5.9	56
Honolulu	7	1014.6	1015.2	79	65	71.8	-.4	85	23	59	28	0	0	61	72	1.49	-3.16	.63	7	1	.0	0	9.6	ENE	38	NE	4	13	9	9	5.2	68
Koror CO	94	1005.4	1009.1	87	75	81.2	+1.0	89	°5	73	°5	0	0	--	--	4.94	-7.09	2.16	22	0	.0	0	4.9	---	22	NE	20	1	10	20	8.0	--
Lihue	115	1009.5	1014.6	77	62	69.5	-.6	80	31	54	°13	0	0	61	78	2.92	-3.31	.83	10	4	.0	0	9.5	NE	33	NE	5	11	9	11	5.4	47
Moen(Truk Group)	3	1009.0	1009.2	85	76	80.6	-.3	86	°1	72	7	0	0	--	--	4.13	-3.46	1.85	18	0	.0	0	----	---	--	---	--	0	10	21	8.5	--
Wake Island	11	1012.5	1013.2	82	73	77.5	.0	85	7	67	29	0	0	68	72	2.32	+1.06	.68	15	0	.0	0	12.5	E	--	---	--	13	15	3	4.2	--
Yap CO	51	1007.8	1009.6	85	76	80.9	+.1	87	13	74	°3	0	0	--	--	2.97	-3.86	1.38	18	0	.0	0	----	---	-	---	--	0	12	19	7.8	--
WEST INDIES																																
San Juan CO	47	------	------	80	70	75.0	+.1	83	11	66	30	0	0	--	--	3.45	-1.24	1.14	21	0	.0	0	----	---	--	---	--	--	--	--	---	--
San Juan, P. R.	9	1015.2	1017.4	82	70	75.5	+.7	84	11	63	30	0	0	67	77	3.96	-1.62	1.22	23	1	.0	0	10.5	E	28	E	22	7	21	3	5.0	70

Data from airport unless otherwise specified. CO indicates data from city office.
• Data entered in column "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.
° Other dates also.
† Peak gust.

HEATING DEGREE DAYS

(Base 65°F.)

Table 3

JANUARY 1954

State and station	Current season		Normals
	This month	Period July through this month	July through this month
ALABAMA			
Birmingham	576	1724	1753
Mobile	359	1058	1039
Montgomery (CO)	437	1272	1263
Montgomery	465	1393	1381
ARIZONA			
Flagstaff	1124	3991	4198
Phoenix (CO)	326	864	980
Phoenix	388	1034	1119
Prescott	814	2467	2641
Tucson	352	1033	1123
Winslow	897	2845	2904
Yuma	258	616	682
ARKANSAS			
Ft. Smith	794	2131	2048
Little Rock	712	1914	1898
Texarkana	556	1635	1513
CALIFORNIA			
Bakersfield	504	1385	1380
Bishop	833	2476	2515
Blue Canyon	924	2833	2899
Burbank	381	808	976
Eureka (CO)	551	2399	2585
Fresno	560	1566	1640
Los Angeles (CO)	292	595	779
Los Angeles	349	823	1075
Mt. Shasta (CO)	966	3016	3324
Oakland	507	1542	1790
Red Bluff	594	1486	1559
Sacramento (CO)	529	1409	1594
Sacramento	571	1565	1714
Sandberg (CO)	762	2279	2184
San Diego	302	629	813
San Francisco (CO)	412	1559	1709
San Francisco	474	1665	1890
San Jose	459	1215	1348
Santa Maria	469	1505	1566
COLORADO			
Alamosa	1339	4971	5112
Colorado Springs	908	3194	3513
Denver	884	2942	3489
Grand Junction	994	3145	3564
Pueblo	872	2848	3383
CONNECTICUT			
Bridgeport	1151	2813	3169
Hartford	1251	3147	3458
New Haven	1191	3039	3276
DELAWARE			
Wilmington	1040	2707	2824
DIST. OF COLUMBIA			
Washington (CO)	889	2250	2488
Washington	893	2303	2523
FLORIDA			
Apalachicola (CO)	312	778	827
Daytona Beach	159	413	533
Fort Myers	72	201	250
Jacksonville (CO)	235	667	719
Jacksonville	266	736	804
Key West (CO)	8	29	46
Miami (CO)	29	95	110
Int. Airport, Hialeah	24	88	118
Miami Beach	15	51	80
Orlando	130	356	410
Pensacola (CO)	328	903	912
Tallahassee	310	917	991
Tampa	113	296	424
West Palm Beach	31	113	154
GEORGIA			
Albany	362	1106	1154
Athens	616	1738	1738
Atlanta (CO)	609	1710	1745
Atlanta	611	1724	1757
Augusta	511	1544	1356
Columbus	490	1465	1514
Macon	453	1358	1321
Rome	682	2023	1956
Savannah	370	1124	1099
Valdosta	315	937	987
IDAHO			
Boise	876	2964	3509
Lewiston	997	2865	3307
Pocatello	1069	3435	4060
ILLINOIS			
Cairo (CO)	865	2265	2321
Chicago (CO)	1122	2922	
Chicago	1149	3053	3595
Chicago University	1124	2985	
Moline	1284	3384	3730
Peoria	1159	3151	3563
Springfield (CO)	1050	2739	3114
Springfield	1085	2956	3359
INDIANA			
Evansville	945	2645	2654
Ft. Wayne	1126	2177	3582
Indianapolis (CO)	1016	2758	2905
Indianapolis	1052	2964	3263
INDIANA (Cont'd.)			
South Bend	1184	3311	3694
Terre Haute	1044	2946	3188
IOWA			
Burlington	1246	3234	3605
Des Moines	1405	3477	3802
Dubuque	1430	3831	4215
Keokuk (CO)	1167		
Sioux City	1515	3772	4156
KANSAS			
Concordia (CO)	1190	2943	3192
Dodge City	1036	2808	3027
Goodland	1105	3366	3676
Topeka (CO)	1139	2757	2979
Topeka	1150	2864	3152
Wichita	1056	2643	2786
KENTUCKY			
Lexington	913	2574	2892
Louisville (CO)	890	2315	2556
Louisville	894	2530	2666
Pikeville (CO)	801	2283	
LOUISIANA			
Baton Rouge	338	1047	1039
Lake Charles	308	950	1009
New Orleans (CO)	264	764	770
New Orleans	287	838	
Int.Airport,Moisant	307	912	848
Shreveport	479	1349	1398
MAINE			
Caribou	1813	5166	5663
Greenville (CO)	1702	4762	
Portland	1454	3918	4220
MARYLAND			
Baltimore (CO)	875	2173	2417
Baltimore	986	2631	2683
Frederick	1058	2966	2842
MASSACHUSETTS			
Boston	1201	2801	3128
Milton	1308	3291	
Nantucket	1021	2696	3098
Pittsfield	1420	4015	4291
MICHIGAN			
Alpena (CO)	1414	3936	4320
Detroit	1200	3145	3536
Escanaba (CO)	1490	4147	4686
Grand Rapids (CO)	1232	3227	3597
Grand Rapids	1279	3468	3927
Lansing	1291	3538	3906
Marquette (CO)	1472	4150	4602
Muskegon	1275	3441	3836
Sault Ste. Marie	1665	4692	5162
Ypsilanti	1220	3262	
MINNESOTA			
Duluth (CO)	1835	5169	5386
Duluth	1893	5232	5600
International Falls	2157	5840	6145
Minneapolis	1693	4207	4577
Rochester	1641	4350	4716
St. Cloud	1904	4910	5173
MISSISSIPPI			
Jackson	479	1451	1417
Meridian	506	1555	1517
Vicksburg (CO)	444	1337	1282
MISSOURI			
Columbia	1070	2713	3064
Kansas City	1101	2677	2960
St. Joseph	1219	3020	3223
St. Louis (CO)	957	2380	2686
St. Louis	992	2538	2822
Springfield	963	2566	2842
MONTANA			
Billings	1469	3537	4072
Glasgow (CO)	1987	4513	5141
Great Falls	1696	3819	4270
Havre (CO)	1915	4345	4811
Helena	1510	4035	4818
Kalispell	1355	4255	4720
Miles City	1710	4034	4584
Missoula	1285	3936	4684
NEBRASKA			
Grand Island	1351	3510	3761
Lincoln (CO)	1325	3247	3490
Lincoln	1369	3301	3623
Norfolk	1484	3787	4161
North Platte	1248	3661	3852
Omaha	1399	3281	3675
Scottsbluff	1106	3396	3925
Valentine (CO)	1309	3570	4091
NEVADA			
Elko	1217	4057	4241
Ely	1166	4031	4232
Las Vegas	602	1641	1622
Reno	916	3182	3474
Tonopah	983	3042	3323
Winnemucca	960	3414	3765
NEW HAMPSHIRE			
Concord	1432	3861	4299
Mt. Washington	1823	7373	
NEW JERSEY			
Atlantic City (CO)	924	2257	2502
Newark	1088	2648	2951
Trenton (CO)	1052	2617	2856
NEW MEXICO			
Albuquerque	818	2546	2727
Clayton	859	2797	2986
Roswell	696	2241	2202
NEW YORK			
Albany	1436	3665	3901
Binghamton	1393	3794	4193
Buffalo	1282	3327	3695
New York (CO)	1036	2447	2766
La Guardia Field	1031	2367	2724
Rochester	1310	3439	3765
Schenectady	1368	3415	
Syracuse	1374	3457	3594
NORTH CAROLINA			
Asheville (CO)	752	2362	2427
Asheville	803	2684	
Charlotte	667	1852	1978
Greensboro	797	2219	2319
Hatteras (CO)	537	1250	1315
Raleigh (CO)	685	1804	1857
Raleigh	719	1961	2036
Wilmington	508	1390	1402
Winston-Salem	767	2055	2255
NORTH DAKOTA			
Bismarck	1996	4768	5254
Devils Lake (CO)	2175	5344	5769
Fargo	2060	5127	5399
Grand Forks	2138	5398	
Pembina	2275	5400	
Williston (CO)	2034	4741	5271
OHIO			
Akron	1150	3292	3464
Cincinnati((CO)	885	2418	2653
Cincinnati	948	2747	3028
Cleveland (CO)	1088	2777	3112
Cleveland	1124	3012	3313
Columbus	1024	2949	3233
Dayton	1035	2917	3222
Sandusky (CO)	1094	2883	3238
Toledo	1173	3199	3573
Youngstown	1180	3334	3437
OKLAHOMA			
Oklahoma City (CO)	843	2192	2210
Oklahoma City	830	2203	2282
Tulsa	864	2151	2238
OREGON			
Astoria	758	2565	
Burns (CO)	1043	3539	4103
Eugene	747	2438	2770
Meacham	1119	3853	4348
Medford	793	2537	2711
Pendleton	939	2705	3161
Portland (CO)	758	2119	2418
Portland	797	2422	2673
Roseburg	722	2275	
Salem	761	2485	2640
Sexton Summit (CO)	983	3293	3278
PENNSYLVANIA			
Allentown	1197	3161	3337
Harrisburg	1094	2853	3022
Park Place (CO)	1340	3708	4012
Philadelphia (CO)	971	2312	2557
Philadelphia	1026	2566	2777
Pittsburgh (CO)	985	2627	2882
Pittsburgh	1091	3067	3384
Reading (CO)	1057	2658	2888
Scranton (CO)	1212	3189	3413
Williamsport	1206	3269	3382
RHODE ISLAND			
Block Island	1048	2598	2989
Providence	1206	3067	3346
SOUTH CAROLINA			
Charleston (CO)	373	1022	1103
Charleston	420	1247	1250
Columbia (CO)	497	1373	1446
Columbia	543	1559	1544
Florence	513	1443	1603
Greenville	642	1778	1873
Spartanburg	651	1817	1881
SOUTH DAKOTA			
Huron	1773	4442	4626
Pierre	1624	4013	
Rapid City	1387	3553	4219
Sioux Falls	1700	4352	4637
TENNESSEE			
Bristol	833	2467	2506
Chattanooga	706	2085	2105
Knoxville	774	2189	2214
Memphis	684	1944	1973
Nashville	765	2190	2150
TEXAS			
Abilene	581	1648	1721
Amarillo	775	2352	2651
Austin	402	1168	1130
Brownsville	92	351	437
Corpus Christi	180	565	695
Dallas	576	1538	1477
Del Rio	344	1082	1004
El Paso	551	1750	1756
Ft. Worth	592	1596	1512
Galveston (CO)	243	704	758
Galveston	259	742	780
Houston (CO)	253	802	843
Houston	271	874	903
Laredo	183	627	576
Lubbock	717	2163	2256
Midland	550	1610	
Port Arthur	302	968	993
San Angelo	504	1532	1410
San Antonio	324	1026	1062
Victoria	243	767	760
Waco	501	1380	1311
Wichita Falls	669	1770	1937
UTAH			
Milford	1051	3542	3828
Salt Lake City (CO)	864	2696	3219
Salt Lake City	951	2966	3473
VERMONT			
Burlington	1612	4055	4385
VIRGINIA			
Lynchburg	857	2344	2471
Norfolk	713	1814	1986
Richmond	829	2188	2360
Roanoke	851	2053	2472
WASHINGTON			
Olympia	906	2997	3122
Seattle (CO)	796	2307	2529
Seattle	890	2824	3025
Spokane	1175	3499	3993
Tatoosh Island (CO)	788	2938	3193
Walla Walla (CO)	930	2457	2989
Yakima	1134	3293	3657
WEST VIRGINIA			
Charleston	830	2483	2607
Elkins	1029	3367	3312
Huntington (CO)	825	2410	2434
Parkersburg (CO)	919	2631	2773
Petersburg (CO)	1011	2776	2948
WISCONSIN			
Green Bay	1521	4122	4641
La Crosse	1526	3882	4459
Madison (CO)	1408	3693	4164
Madison	1397	3744	4269
Milwaukee (CO)	1254	3336	3825
Milwaukee	1296	3518	3999
WYOMING			
Casper	1168	3750	4345
Cheyenne	1007	3578	4137
Lander	1168	3834	4833
Rock Springs	1179	4064	4810
Sheridan	1425	3829	4505

Data from airport unless otherwise specified. CO indicates data from city office.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4

JANUARY 1954

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Mason (near), Bayfield County, Wis.	1	5:30 p.m.			2				Snow	Small airplane lost its way and crashed in snowstorm while enroute from Waukegan, Ill. to Ironwood, Mich.
Washington, coast to Cascades	2	Early morning until nearly midnight			1		$50,000		Wind	Greatest damage in Puget Sound area. Power and communication service disrupted and trees blown down in several localities. 1 person electrocuted by falling power line in Olympia. Ferry schedules disrupted in Puget Sound. Estimated $20,000 damage to oil tanks under construction near Bellingham.
Washington, Puget Sound area and south to Oregon border	2-10						75,000		Rain	Landslides in several localities, as a result of continuous heavy precipitation. Several homes damaged in Seattle. Slides covered railroad between Tacoma and Nisqually and highway near Eatonville.
Oregon, northwestern portion	2-3	Afternoon and evening of 2d — early morning of 3d	*120	150			60,000	Negligible	Wind and rain	High winds smashed power lines over fairly large areas, disrupting both telephone and power services for as much as several hours in hundreds of homes and industrial establishments. Accompanied by heavy rains that produced major flooding in a number of coastal streams. These floods were further augmented by high tides driven back up streams by high winds. Quite a number of trees, both domestic and marketable forest trees, blown down. Probably 80 percent of damage caused by winds, remainder by heavy rains.
Pennsylvania, central and southern portions	3	Midnight to mid-morning			3	20			Ice (glaze)	Rain on highways with temperature just below freezing resulted in a few serious and scores of minor skidding accidents.
South Parkersburg, W. Va.	3	5:35 a.m.				2	2,500	$0	Electrical	Lightning struck an improperly grounded television antenna and started fire in upstairs of residential property.
Louisiana, coastal area	3-4						2,500		Fog	Dense fog covered coastal area from east Texas to Florida. 2 boats collided in Intercoastal Waterway near Lake Charles, another ran aground near Morgan City.
Gulfport, Harrison County, Miss.	4	A.m.					Slight		do	A boat ran aground off Gulfport. Dense fog all along coast from east Texas to Florida; visibility near zero in many places.
Louisville, Ky.	4	P.m.					500		Electrical and hail	Lightning demolished chimney and knocked 2 holes in roof of apartment building. Some hail fell during storm, but no hail damage.
Pennsylvania, south-central portion	5	Evening				7			Snow	Thin snow cover produced slick highways, resulting in skidding accidents.
Island of Oahu, Hawaii	5						Several hundred		Wind	Roofs and power lines damaged. Automobile tops blown off crossing Nuuanu Pali.
Lanai City, Island of Lanai, Hawaii	5						1,000		do	Chief damage to roofs and power lines.
Pennsylvania, south-central portion	6	Day			5	4			Snow	Slick highways resulted in series of traffic accidents.
West Palm Beach, Fla.	9				0	0	0	0	Tornadoes	Funnel clouds observed: First about 5 miles south-southeast of airport, lasted 4 minutes. Second about 3 miles northeast of airport, lasted 3 minutes.
New England, and southern and central coastal areas, except Massachusetts	9-11				17				Northeast storm with heavy snow	3-day accumulation of snow ranged up to 16 inches over eastern Massachusetts. All forms of transportation halted or seriously delayed, and many schools closed on 11th. Most deaths due to overexertion in shoveling snow; 3 deaths resulted from swamping of dory at sea. Cost of snow removal from streets and highways in and around Boston approximately a quarter million dollars.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Pennsylvania, south-central and southeastern portions	10-11	Day and evening			4	16			Snow	4 to 9-inch snowfall hampered highway travel and resulted in numerous accidents.
New Jersey, entire State	10-11					5			do	Snowfall of 7 to 12 inches, except 2 to 3 inches in southern coastal area, caused traffic tieups in urban localities, and entirely blocked roads in rural sections. Property damage and injuries confined to traffic mishaps.
New York State, extreme southeastern portion including Long Island	10-12				Several				do	Heaviest snowfall in 5 years fell in area, with depths ranging up to more than 12 inches. Traffic disrupted, but no serious damage. Several persons died from overexertion due to walking in or shoveling snow.
Baltimore, Md.	12				2				do	Deaths attributed to weather.
Pennsylvania, southeastern portion	13	Day				1			Snow and winds	High winds drifted snow across highways, blocking many, which resulted in shutdown of many schools. Highway accidents in heavy snow squalls damaged 4 cars and injured 1 person near Palmyra.
Sitka, Alaska	14	1 a.m.-2 p.m.					$25,000		Wind	Unusually high easterly winds at Sitka morning of 14th with northeast wind of 55 m.p.h. and gusts to 70 at 3:02 a.m. Large part of small boat harbor docking facilities lost as gale winds loosened pilings and allowed main float, with about 20 boats moored to it, to be blown a half mile across channel to Mt. Edgecumbe side. Small cabin cruiser badly crushed and other larger craft damaged. Float handled major portion of larger crafts making up Sitka's fishing fleet.
Harrisburg, Pa.	14	Day				4			Snow	Snow and ice covered walks and roadways, resulting in at least 4 injuries from falls, and skidding accident between truck and car and roadside signs.
Wyoming, statewide	14 and 15						Small		Snow and wind	Near-blizzard conditions locally east of Continental Divide.
Nevada, western portion	14 to 18						100,000		Wind, snow in mountains	Extreme gustiness on 14th and 15th reaching peak speeds of 92 m.p.h. at 7:30 a.m. on 14th and 96 m.p.h. at 7:19 p.m. on 15th. Numerous signs, windows, etc., broken. Several houses and numerous barns and outbuildings suffered major damage or were totally destroyed. Damage given is for Reno area.
Idaho, northern and central portions	14-23								Snow, wind, and cold	A slow-moving cold front entered extreme northern portion of State on 14th, bringing 24 inches of snow to Porthill and 14 inches to Bonners Ferry in 48 hours. During 10-day period front advanced and retreated in irregular fashion across several northern counties. Widespread heavy snows on 17th and 18th, with 48-hour falls of 14 inches at Priest River and Sandpoint, and 16½ inches at Porthill and Wallace. Cold air pushed southward to southern boundary of State on 19th and 20th, but very little precipitation. On 21st and 22d cold front retreated northward rather rapidly and some of heaviest snows of month fell from Adams and Valley Counties northward. High winds on several days; roads and railways blocked by drifts and in some localities power and telephone lines broken. Minor traffic accidents numerous and both N.P. and U.P. Railroads had derailments in vicinity of Wallace, where snowslides added to difficulties. During period snow depths increased as much as 3 to 4 feet at many stations. Temperatures fell below zero for at least 2 or 3 days at many stations in affected area, reaching -27° at Porthill.
Stonewall Community, (near College Park), Ga.	16	6 a.m.					1,500		Wind	High wind tore porch from home; 2 small garages and a barn destroyed.
Mountain Park Community, (5 miles northwest of Roswell), Ga.	16	6 a.m.					2,500		do	Large pine tree blown across home.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Atlanta, Ga.	16	6-6:30 a.m.					$2,000		Rain, wind, and electrical	Wind blew down central power and telephone lines in Grove Park, knocking out services. Lightning struck theater, hurling bricks over 200-foot area. Heavy rains flooded many streets, accumulating depths in some low-lying areas of 3 feet or more. Flooding of main cable in Highland-Virginia section resulted in disruption of about 2,000 telephones. Numerous other minor damages over much of city.
Conyers, Ga.	16	6:30 a.m.					3,000		Wind	Tenant house destroyed and 2 house roofs damaged in town; 1 hangar destroyed and doors ripped off of another hangar at airport. Numerous trees uprooted, and lines blown down.
Sierra Madre, Los Angeles County, Calif.	19								Rain	Flood water from heavy rains forced many people to evacuate homes; 14 homes damaged.
Pasadena to Los Angeles-San Bernardino County line (foothill communities), Los Angeles County, Calif.	19						1,000,000		do	Damage includes $250,000 for cleaning city and county roads; $100,000 for structural damage to about 25 homes - the worst being in Palmer Canyon above Claremont; remaining damage in deposits of mud, silt, rocks, etc., in county-owned reservoirs which will have to be cleaned.
Oktibbeha and Lowndes Counties, Miss.	20	5:30 a.m.	25	15	0	2	10,000	$1,000	Tornado	Developed from a line of squalls in southeastern Oktibbeha County near small community of Oktoc; a witness there reported that clouds appeared as 2 ribbons in the sky, 1 appeared to touch ground, then clouds began to twist and larger cloud drew in smaller one. Then it moved northeastward at about 10 to 15 m.p.h. in a zig-zag course, into northwestern Lowndes County. It appeared to have been of the "skip and hit" type. Destroyed 2 homes and a barn, and damaged some others; damaged some power lines, and a little timber. Passed aloft between Artesia and Mayhew.
Akron-Canton-Massillon area, Ohio	20	9:20-9:27 a.m.					5,000		Electrical	Lightning struck dwelling in Canton during thunderstorm.
Lowndes County, Miss.	20	5:30-6 p.m.	100	4	0	0	2,000	500	Tornado	About 5 to 7 miles south of Columbus on west side of Tombigbee River in a thinly populated farming area. Destroyed and damaged some outbuildings. Moved northeastward.
Lowndes County, Miss.	20	P.m.					10,000		Electrical	Lightning destroyed 1 home and all the furnishings near New Hope community.
Pennsylvania, central and eastern portions	20-21					10			Fog	Widespread, long-lasting heavy fog hampered busses, trains, cars, and pedestrians. In Harrisburg area alone, traffic accidents caused injury to at least 10 persons. Visibility frequently less than 100 feet.
Oregon, northwestern portion	21-22	Early morning of 21st, through early morning of 22d	*150	200			250,000	5,000	Snow, glaze (ice), and wind	High winds and comparatively heavy snows which in some small local areas was freezing rain took an extremely heavy toll of power and communication lines and other facilities. Damage to these utilities alone exceeded $225,000. Also damaged were a number of farm buildings, some livestock, stored crops, and coastal property and shipping. Damage 75 percent result of snow and ice, remainder due to wind.
Hana, Is. of Maui, Hawaii	21								Wind	Trees blown down, roads blocked, and phone service disrupted.
North Carolina	22-23				2	2	10,000		Rain, sleet, and snow	1 man died in Wake County and another in Wayne County due to exposure. Property damage mostly to power and telephone lines, and in traffic accidents; the latter also accounting for the injuries. All North Carolina rivers flooded following this storm, resulting in 1 additional death (from drowning) and considerable damage. (See summary of flood conditions that follows this table).
Duarte, Los Angeles County, Calif.	24								Rain	Water and mud flowed through 2 homes, causing major damage to floors, windows, and household furnishings and caved in a wall in each. 18 to 20 homes suffered minor damage, primarily to garages, floors,

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Duarte, Los Angeles County, Calif. (cont'd.)	24									and doors. These homes have cesspools which will have to be replaced. 150 homes received debris on lawns and gardens, consisting of rocks, mud, etc.
Washington, western portion	25-26		*120	180	1		$150,000		Snow and wind	Heavy snowfall and high winds over Olympic Peninsula. Power and communication lines disrupted in southwestern Washington. Several localities in Grays Harbor, Pacific, and Thurston Counties without power and telephone service for 2 or 3 days. Most schools closed. 1 person killed when building roof collapsed near Longview.
St. Louis and St. Louis County, Mo.	26	3-6 p.m.					2,000		Wind and electrical	Damage mainly confined to roofs, sidings, signs, and windows.
Oregon, most of State	26-27	Considerable portion of both days	Statewide	300-400			20,000	Negligible	Snow, rain, and wind	Heavy snows in Columbia Gorge and eastern Oregon tied up traffic and induced a number of slides. Along coast and in northwestern portion heavy rains and high winds added to difficulties. At Coos Bay the New Zealand ship S.S. *Waikawa* was blown loose from its mooring and swept across bay. No serious damage caused, but several hours required by 5 tug boats to free ship and get it back into channel. Damages estimated to be equally divided between rain, wind, and snow.
Plandome, Nassau County, N. Y.	27	8:15 p.m.					10,000		Electrical	Club destroyed.
New Jersey, entire State	27	P.m.					10,000		do	Thunderstorms reported at nearly every station and substation in State. Lightning struck house in Ocean County, near Lakewood, and completely burned out its electrical wiring system. Barn struck near Long Valley and destroyed by fire. Trees and poles damaged in isolated sections.
Ketchikan, (25 mile radius of), Alaska	30	Midnight-12 noon					151,000		Wind, snow, and rain	At Annette a fastest mile of 56 m.p.h. from south-southeast, with an average 24-hour wind speed of 32 m.p.h. on 30th. At Guard Island wind speed reached 72 m.p.h. with gusts to 92 at 10:20 a.m.; at that time Coast Guard observers reported 5-foot waves on a swell of 7 feet from south. Many breaks in Ketchikan Power lines, one break caused by a roof falling over lines. Main feeder burned out, with loss of $1,000. Several roofs in Ketchikan blown off or damaged, but no estimates of damage available. The Manson-Osberg dredge sank at Clover Pass, with a loss estimated at $150,000.
Juneau, Alaska	Jan. 30-Feb. 1						2,000		Snow and rain	Snow that began on 28th turned to mixed rain and snow late on 29th and 30th. Driving particularly hazardous morning of 30th, with over 30 cars off road between Airport and City of Juneau. About 50 cars off road in all from January 30 to February 1. No injuries, but damage to several cars estimated at $2,000.

* Miles instead of yards.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

JANUARY 1954

The most significant flooding during the month occurred in streams along the California coast. The Russian River reached its highest stage at Guerneville since February 1940, and at Healdsburg since January 1943. Two major floods were reported on the Eel River at Fernbridge, Calif. Considerable damage was reported from flash floods in northern Alabama; the Flint River reached the highest stage in its history in the upper portion. The Tar and Neuse Rivers in eastern North Carolina reached their highest stages since 1945.

ATLANTIC SLOPE.--Heavy precipitation from the 14th to the 16th, and again from the 19th to the 24th, caused general flooding along all of the main streams in eastern North Carolina. The precipitation during the first storm averaged almost 2 inches in the Roanoke Basin, 2.5 inches in the Neuse and Cape Fear Basins, and almost 3 inches in the Tar Basin. During the second storm the precipitation averaged 3 inches in the Roanoke Basin, 3 3/4 inches in the Neuse and Cape Fear Basins, and 4 1/3 inches in the Tar Basin. The precipitation changed from rain to snow and sleet on the 23d and averaged 3 to 4 inches over the greater portion of the Roanoke and Dan Basins, 5 inches along the upper Neuse Basin, 4 to 8 inches over the upper Cape Fear Basin, and 3 to 5 inches over the upper Tar Basin. In general, the snow was limited to the middle and upper sections of the basins while the area nearest the ocean was free of snow. Very little snow melted on the 23d and 24th, but warming on the 25th and 26th disposed of most of the snow, adding to the runoff.

No flooding occurred along the Dan and Roanoke Rivers during the first storm. The second rainy period brought light general flooding along the entire Roanoke system.

The second period of rainy weather produced a second crest along upstream points on the Tar and Neuse Rivers while at downstream points only one crest resulted from the two periods of heavy rainfall. The Neuse and Tar Rivers reached their highest stages since 1945 at several points.

Along the Cape Fear River, the second period of precipitation produced another crest at all reporting points.

One fatality was reported along the Tar River and there was considerable economic loss due to flooding of tobacco plantbeds and residential property, loss or damage to boats, suspension of business, etc. Several thousand acres were inundated along the lower Neuse River, causing considerable damage to residential property, public property, tobacco plantbeds, and loss of livestock.

The heavy rains on the 16th and 17th and again on the 22d and 23d, produced two successive floods in the Pee Dee River and the Santee River systems in South Carolina. A minor flash flood occurred on the Yadkin River at Wilkesboro, N. C., on the 22d from the heavy rains and snow. No preventable damage was reported. In the Saluda Watershed the only flooding reported was at Pelzer, as nearly all runoff was contained in Lake Greenwood and Lake Murray. On the Broad River, minor flooding occurred at Gaffney and at Blairs on the 23d and 24th. The lowlands below Columbia had considerable flooding in the first flood on the 18th and even higher crests in the second flood from the 23d to the 25th. No loss was reported on the Catawba-Wateree Rivers.

The flooding on the Altamaha River at Charlotte, Ga., receded to within its banks on the 4th.

EAST GULF OF MEXICO DRAINAGE.--Heavy rainfall of 4 to 5 inches on the 15th and 16th in the Chattahoochee Basin above Norcross, Ga., resulted in above flood stage at Norcross on the 17th and 18th and caused rather widespread flooding of lowlands near Atlanta and to the north. Heavy rain again on the 21st and 22d caused another brief flood condition to the north of Atlanta. The Apalachicola River continued near or above flood stage throughout the month at Blountstown, Fla., this being a normal winter-time condition.

Additional rain the last 3 days of December caused the Choctawhatchee River to rise above flood stage at Caryville, Fla., during the first few days of January 1954.

Heavy rains over northwest Florida and northern Alabama from the 14th to the 16th, and again from the 20th to the 22d, caused moderate floods on the Coosa River in Alabama, and the Etowah and Oostanaula Rivers in Georgia, and flash floods in northern Alabama. The first period of heavy rains averaged 4.5 inches above Canton and 3.8 inches above Cartersville on the Etowah River, resulting in a crest stage of 21.7 feet at Canton, 4.7 feet above flood stage, on the 17th. Rainfall averaged 5.3 inches above Resaca, on the Oostanaula, resulting in a rather severe flood crest stage of 30.2 feet at Resaca, 8.2 feet above flood stage, on the 18th. Rainfall averaged 4.4 inches above Rome, on the Oostanaula, resulting in a crest stage of 24.5 feet at Rome, 0.5 foot below flood stage, on the 17th. Rainfall averaged 3.8 inches above Gadsden, on the Coosa River, causing a primary crest of 23.8 feet at Gadsden, on the 18th.

Flash floods occurred in the Birmingham, Ala., area following the heavy rains of the 15th which flooded numerous houses and several business houses to about knee deep. Local flooding was also reported in the Trussville, Gadsden, Albertville, Boaz, Sand Mountain, and other areas.

The second period of heavy rainfall (20th to the 22d) averaged 3.25 inches above Canton on the Etowah, giving Canton a crest of 15.7 feet, 1.3 feet below flood stage on the 23d. Rainfall averaged 3.8 inches above Resaca, resulting in a secondary crest stage of 27.6 feet, 5.6 feet above flood stage on the 25th. Rainfall averaged 2.8 inches above Rome, giving a crest stage of 26.1 feet, 1.1 feet above flood stage on the 22d and 23d. Rainfall averaged 3.0 inches above Gadsden, giving a secondary crest stage of 24.3 feet, 4.3 feet above flood stage on the 25th.

Flash floods caused considerable damage in Limestone and Madison Counties in Alabama from the heavy rains on the 20th, 21st, and 22d. More than 126 families were evacuated from the Big Cove and other areas during the night of January 21-22, as the water rose to a depth of one foot in their homes. The water reached its highest stage in its history in the upper branches of Flint River around New Market, Moore's Hill, Ryland, and Three Forks of Flint. Water was reported 6 feet deep in some homes. Overflow of Mountain Fork Creek swept away one residence at New Market and flooded two others. Homes were flooded in Meridianville. Roads were under water in every section of Madison County. Practically every wooden bridge in the northwest section of Madison County was washed away. In Limestone County and Athens area, all roads were blocked between Athens and Huntsville. Many bridges were washed out, bridges were covered by water on Highway 52 and the Nick Davis Road. Water drove a number of families from their homes, disrupted bus and private travel, and did untold damage to roads and bridges in the area. These flash floods were estimated to have caused damage of $100,000. Flooding along main streams caused damage of around a quarter million dollars.

The flooding on the Warrior and Tombigbee Rivers in Alabama was due to the heavy rainfall on the 15th-16th and 21st-22d. No severe damage resulted from the overflows.

Minor flooding occurred on the Pearl River at Jackson, Miss., between the 26th and 28th. No damage was reported.

OHIO BASIN.--Two periods of heavy rain during the month, the first occurring on the 15th and 16th and the second from the 20th through the 22d, produced flood stages on several tributaries of the Tennessee River. Rainfall over the area during the first storm period averaged near 4 inches above Chattanooga and about 3.5 inches below Chattanooga, with some locally high amounts up to 5.5 inches. There was no serious flooding during the first storm as the ground was very dry and flows in the main river were near or slightly below the normal minimum for this time of the year. The second rain produced an average of about 4.5 inches above Chattanooga. Ground conditions were favorable for high runoff this time, since this storm occurred within a few days after the first heavy rain which conditioned the soil for maximum runoff. The overflow on the Elk River at Fayetteville reached serious proportions. The crest stage of 666.8 feet was only 2.6 feet below the great flood of January 5, 1949. Flooding on the main river was limited to agricultural lowlands not subject to significant damage at this time of the year. Damages to secondary roads and farm property, such as fences, farm bridges, and roads, were heavy along many of the small creeks and tributaries. Considerable damage also occurred to the water cress crop on the lowlands of the Flint River. Commercial and residential damages also were considerably higher than other floods of recent years; practically all of these occurred in small settlements located on or near some of the creeks and small tributaries in the central portion of the basin.

ARKANSAS BASIN.--Minor flooding occurred along the low bottom lands of the Poteau River around Panama, Okla., on the 20th from heavy thundershowers (2.5 inches). Flood damage was mostly to spinach crops and other vegetables and to land preparation.

RED BASIN.--The flooding on the Sulphur River was due to the heavy rain from the 14th to the 16th. The runoff was heavy as the ground was conditioned for maximum runoff from the rains on the 10th and 11th.

LOWER MISSISSIPPI BASIN.--The Mississippi River receded below the zero of the gage at Memphis, Tenn., on September 12, 1953, and with the exception of one day (December 18, when the stage was +0.1 foot), it remained below zero through January 15, 1954. This was a total of 125 of 126 consecutive days. It was -3.0 feet or lower from October 6 to 8, and from October 14 to December 5, a total of 56 days, 53 of which were consecutive. The previous low was -2.7 feet in November 1895. The lowest stage of record -3.55 feet, was reached on November 21, 1953.

WEST GULF OF MEXICO.--Minor flooding occurred along the Sabine at Mineola and Gladewater, Tex., between the 17th and 28th from the heavy rains (1.5 inches) near the middle of the month. Precipitation for the month averaged only about half of normal and was scattered throughout the month. Damages were chiefly temporary loss of pasture land and the expenses of moving cattle.

CALIFORNIA AND OREGON COAST DRAINAGE.--The heavy rainfall on the 17th to 19th and from the 23d to 25th caused flooding at the mouths of a series of foothill creeks in southern California at the base of the San Gabriel Mountains between Bailey Canyon on the west and San Antonio Canyon on the east. The creeks are tributaries to the Rio Hondo, San Gabriel River, and the Santa Ana River. Total rainfall for the first storm ranged from about 3.5 inches in the foothills to about 7 inches at or near the mountain peaks. The total for the second storm ranged from 3 inches in the foothills to about 6 inches at or near the peaks. Severe damage occurred in several foothill communities between Pasadena and the Los Angeles-San Bernardino line, principally as a result of debris flow.

Overflows occurred along the east-side weirs (dams) on the Sacramento River on the 18th to the end of the month from the moderate to heavy rainfall which began on the 16th.

The flooding on the Russian River in California was due to heavy rainfall from the 15th to the 17th which ranged from 13.06 inches at Cazadero to 3.34 inches at Petaluma or an average of 7.2 inches for the basin. The peak stage of 22.8 at Healdsburg on the 17th was the highest stage observed at that point since January 21, 1943, when a stage of 25.45 feet occurred. At Guerneville, the peak stage of 38.15 feet on the 17th was the highest stage since February 28, 1940, when a peak of 46.87 feet was reported. Lowlands and some highways from Ukiah to Guerneville were flooded. Roads, culverts, bridges, summer cottages, some automobiles, and some other property sustained flood damage.

Two major floods resulted on the Eel River at Fernbridge, Calif., from the heavy rains on the 16th-17th and the 27th-28th. A total of 8.54 inches was reported at Dos Rios and amounts elsewhere over the headwaters were comparable. The crest during the first rise was 23.0 feet, 5.5 feet above flood stage and during the second rise the crest was 20.9 feet, 3.4 feet above flood stage. Most of the damage was to farm lands.

Heavy rainfall occurred over southwestern Oregon and northern California from the 15th-17th and from the 26th-28th. The rainfall ranged from 1 to 3 inches over the Umpqua and Rogue Rivers during the first storm, but no flooding occurred. During the second storm period the precipitation averaged about 3.3 inches over the same basins including the coastal areas. This precipitation, together with the melting of low-level snow, brought higher stages with some flooding along the Rogue River and the smaller tributaries of the larger streams. Much local flooding occurred along irrigation ditches and drainage ditches. No damage was reported.

COLUMBIA BASIN.--Precipitation was above normal in the Columbia Basin for the third consecutive month, and ranked near the highest of record at many stations in northwestern Oregon and southwestern Washington. Measurable amounts were recorded at many stations in western Oregon on 22 or more days. Albany, Ore., one of the key river stations in the middle Willamette Basin, recorded a measurable amount of precipitation on 28 days. The heaviest and most concentrated precipitation occurred from the 25th to the 27th. This precipitation was partly snow, particularly in the northern portion of the Willamette Valley and almost entirely snow in the mountain areas.

Very little flooding resulted from this precipitation, as a large proportion of it that did occur as rain fell on a snow cover which absorbed most of the precipitation. There was considerable of what might be termed "nuisance flooding" due to overflow and flooding of ditches, bottom lands, and creeks, in the middle and lower Willamette. Much damage occurred in small communities along creeks even though the overflow lasted only a few hours as the water level rose very rapidly.

PUGET SOUND DRAINAGE.--The flooding on the Chehalis, Skookumchuck, and Snohomish Rivers in Washington between the 5th and 8th was due to heavy precipitation over western Washington during the first six days of the month. The flooding occurred mostly on the 6th with only the Chehalis River reporting overflow for a longer period and the only stream that appreciably exceeded flood stage. Damage from this flood was negligible.

FLOOD STAGE DATA

(All dates in January unless otherwise specified)

Table 5

River and station	Flood stage	Above flood stages -dates		Crest•	
		From–	To–	Stage	Date
ATLANTIC SLOPE DRAINAGE	Ft.			Ft.	
Dan: Danville, Va.	11	22	23	[n]11.6	23
Roanoke:					
Altavista, Va.	18	22	23	19.0	23
Randolph, Va.	21	22	24	[n]22.9	23
Williamston, N. C.	10	24	Feb. 1	10.7	30
Tar:					
Rocky Mount, N. C.	9	17 21	19 28	[n]9.4 11.5	18 24
Tarboro, N. C.	19	19	Feb. 2	[n]27.4	28
Greenville, N. C.	14	21	Feb. 2	[n]18.7	29
Neuse:					
Neuse, N. C.	14	15 21	19 29	[n]16.7 [n]19.0	17 23
Smithfield, N. C.	13	15	31	[n]19.0 22.8	19 24
Goldsboro, N. C.	14	19	Feb. 5	24.8	28
Kinston, N. C.	14	23	Feb. 7	20.3	Feb. 1
Cape Fear:					
Moncure, N. C.	20	15 22	16 23	20.0 23.3	16 23
Fayetteville, N. C.	35	17 22	19 27	[n]36.2 [n]47.0	18 24
Lock No. 2, Elizabethtown, N. C.	20	16 21	21 30	28.2 32.6	19 26
Yadkin: Wilkesboro, N. C.	14	--	--	15.6	22
Pee Dee:					
Cheraw, S. C.	30	17 23	18 26	34.0 39.9	17 24
Peedee, S. C.	19	19	Feb. 4	20.3 25.8	24 29
Saluda: Pelzer, S. C.	6	16 22	18 25	10.0 14.0	17 24
Broad:					
Gaffney, S. C.	10	23	23	13.3	23
Blairs, S. C.	14	16 22	19 26	20.0 24.0	17 24
Congaree: Columbia, S. C.	19	25	25	19.4	25
Wateree: Camden, S. C.	23	24	25	29.4	25
Santee: Rimini, S. C.	12	21	••	18.0	°29
Altamaha: Charlotte, Ga.	15	Dec. 24	4	15.5	Dec. 28
EAST GULF OF MEXICO DRAINAGE					
Chattahoochee: Norcross, Ga.	16	17 24	18 24	19.4 17.5	18 24
Apalachicola: Blountstown, Fla.	15	1 23	11 31	18.9 17.1	2-3 29
Choctawhatchee: Caryville, Fla.	12	2	4	12.5	3
Oostanaula:					
Resaca, Ga.	22	17 23	21 27	30.2 27.6	18 25
Rome, Ga.	25	22	23	26.1	22-23
Etowah: Canton, Ga.	17	16	17	21.7	17
Coosa: Gadsden, Ala.	20	17	30	23.8 24.3	18 25
Black Warrior: Tuscaloosa, Ala.	47	16 23	19 24	57.5 50.5	17 23
Tombigbee:					
Lock 4, Demopolis, Ala.	39	20	••	47.8	27
Lock 3, Whitefield, Ala.	33	18	••	49.0	28
Lock 2, Pennington, Ala.	46	22	••	50.4	29
Lock 1, Salitpa, Ala.	31	23	••	34.3	31
Pearl: Jackson, Miss.	18	26	28	18.3	27
MISSISSIPPI SYSTEM Ohio Basin					
French Broad:					
Rosman, N. C.	8	22	22	8.5	22
Asheville, N. C.	9	22	23	9.1	23
Marshall, N. C.	10	22	22	10.5	22
Hot Springs, N. C.	13	22	22	14.3	22
First Creek:					
Knoxville, Tenn. Fifth Avenue	5	15 20	16 22	6.8 7.0	16 21
MISSISSIPPI SYSTEM (Cont'd.) Ohio Basin (Cont'd.)	Ft.			Ft.	
First Creek: (Cont'd.)					
Mineral Springs •	6	15 20	16 22	6.6 6.0	16 22
Emory: Oakdale, Tenn.	23	21	21	24.2	21
South Chickamauga Creek:					
Chickamauga, Tenn.	10	16 21	18 25	16.2 15.9	17 23
Elk: above Fayetteville, Tenn.	18	21	25	24.9	22
at Fayetteville, Tenn.	659	21	25	666.8	22
Duck:					
Shelbyville, Tenn.	21	21	23	21.1 23.8	21 22
Columbia, Tenn.	32	21	25	36.4	22
Centerville, Tenn.	22	21	26	24.9	23
Tennessee:					
Whitesburg, Ala.	560	16 21	20 29	565.5 571.0	18 24
Florence, Ala.	419	17	28	424.4	23
Savannah, Tenn.	380	22	29	385.6	27
Gilbertsville, Ky.	320	21	Feb. 1	326.8	26
Red Basin					
Sulphur: Naples, Tex.	22	18	27	26.2	22
WEST GULF OF MEXICO DRAINAGE					
Sabine:					
Mineola, Tex.	14	17	24	17.2	21
Gladewater, Tex.	26	26	28	27.0	27
PACIFIC SLOPE DRAINAGE Sacramento Basin					
Sacramento:					
Moulton Weir, Calif.	76.7	25	••	77.2	30
Colusa Weir, Calif.	61.8	18	••	65.0	30
Tisdale Weir, Calif.	45.5	18	••	48.3	30
Fremont Weir, Calif.	33.8	27	••	34.7	31
Coastal Drainage					
Russian:					
Healdsburg, Calif.	19	16	17	22.8	17
Guerneville, Calif.	29	17	18	38.2	17
Eel: Fernbridge, Calif.	17.5	16 27	18 29	23.0 20.9	17 28
Rogue:					
Raygold, Ore.	10.5	27	28	14.6	28
Grants Pass, Ore.	17	27	28	19.0	28
Columbia Basin					
Santiam: Jefferson, Ore.	13	22 28	23 30	13.6 17.4	22 28
South Yamhill: Whiteson, Ore.	38	22	23	40.9	23
Tualatin: Dilley 1 SSW, Ore.	12	5 22	7 23	12.5 12.7	6 23
Willamette:					
Harrisburg, Ore.	12	28	29	12.7	28
Albany, Ore.	20	29	30	20.6	29
Oregon City, Ore.	12	30	Feb. 2	13.4	30
Miscellaneous Basins					
Chehalis:					
Centralia 1 W, Wash.	63	5	8	68.6	6
Grand Mound, Wash.	14.5	6	6	16.7	6
Snohomish: Snohomish, Wash.	23	6	6	23.7	6
Skookumchuck:					
Centralia, Wash. (Harrison St. gage)	68	6	6	68.7	6

• Provisional
•• Continued at end of month
[n] Highest stage reported but not necessarily the crest
° Affected by backwater from Lake Marion

RADIOSONDE DATA

Average monthly values

Table 20

JANUARY 1954

Standard pressure surface (mb.)	ALBUQUERQUE, N. MEX. (839 MB.)				ATLANTA, GA. (986 MB.)				BISMARCK, N. DAK. (959 MB.)				BOISE, IDAHO (915 MB.)				BROWNSVILLE, TEX. (1019 MB.)				BUFFALO, N. Y. (993 MB.)				BURRWOOD, LA. (1022 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,619	3.9	44	31	309	6.4	76	31	505	-17.0	75	30	868	1.9	75	31	7	16.7	86	31	221	- 4.9	77	31	3	14.0	90
1000---	31	165			31	195			31	184			30	146			31	168	17.5	82	31	161	-11.2		31	185	15.0	77
950----	31	592			31	625	7.7	62	31	578	-16.9	65	30	568			31	609	15.6	76	31	569	- 6.1	73	31	623	13.5	84
900----	31	1,044			31	1,063	6.8	52	31	981	-13.6	64	30	1,004	3.2	62	31	1,064	14.6	58	31	986	- 7.5	89	31	1,073	11.6	58
850----	31	1,513			31	1,533	6.7	40	31	1,418	-10.5	56	30	1,466	.5	59	31	1,546	13.3	49	31	1,430	- 8.2	65	31	1,550	10.5	41
800----	31	2,009	4.3	37	31	2,029	5.0	38	31	1,886	- 9.3	50	30	1,949	- 2.9	63	31	2,055	12.0	42	31	1,900	- 8.7	58	31	2,053	8.8	38
750----	31	2,539	1.9	35	31	2,563	2.7	35	31	2,391	-10.2	51	30	2,463	- 6.0	64	31	2,600	9.9	35	31	2,405	- 9.7	55	31	2,595	6.4	35
700----	31	3,085	- 1.4	34	31	3,110	.1	32	31	2,914	-11.9	51	30	2,995	- 8.9	63	30	3,164	6.6	33	31	2,928	-12.4	47	31	3,148	3.5	
650----	31	3,674	- 4.7	37	31	3,708	- 3.2		31	3,490	-14.5	51	30	3,573	-12.1	61	29	3,772	2.6		31	3,499	-14.8	46	31	3,749	.8	
600----	31	4,296	- 8.6	38	31	4,329	- 6.9	32	31	4,080	-18.1	50	30	4,174	-15.6	57	29	4,410	- 1.5		31	4,094	-18.0	48	30	4,385	- 3.1	
550----	31	4,966	-12.9	37	31	5,005	-11.3	32	31	4,730	-22.2	49	30	4,830	-19.9	55	28	5,100	- 5.7		31	4,745	-21.3	45	30	5,066	- 7.4	
500----	31	5,685	-17.7		31	5,727	-16.7		31	5,419	-26.8	47	30	5,526	-24.5	52	28	5,838	-10.5		31	5,436	-25.8	41	30	5,804	-12.4	
450----	31	6,471	-23.5	35	31	6,519	-22.5	36	31	6,179	-32.3	44	30	6,293	-29.6	51	28	6,649	-16.3		31	6,198	-31.4	44	30	6,612	-18.3	
400----	31	7,316	-29.9	39	31	7,363	-28.7	39	31	6,992	-38.1		30	7,115	-35.4	48	28	7,516	-22.9		31	7,013	-37.1		30	7,469	-24.8	
350----	31	8,252	-37.0		31	8,305	-35.5		31	7,898	-44.6		30	8,030	-42.6		27	8,479	-30.2		31	7,922	-43.4		30	8,425	-32.2	
300----	31	9,300	-44.9		30	9,361	-43.2		30	8,916	-51.4		30	9,053	-50.3		26	9,554	-38.8		31	8,943	-49.6		30	9,494	-40.3	
250----	31	10,495	-52.8		30	10,565	-51.2		30	10,082	-57.0		30	10,225	-56.5		24	10,779	-48.3		30	10,127	-54.8		30	10,710	-49.9	
200----	31	11,913	-58.4		29	11,994	-58.0		29	11,491	-57.0		30	11,634	-57.3		24	12,214	-57.8		28	11,545	-56.1		30	12,139	-58.0	
175----	31	12,748	-59.7		29	12,831	-59.2		28	12,336	-55.8		30	12,480	-55.7		23	13,050	-61.3		25	12,394	-55.2		30	12,974	-61.2	
150----	31	13,711	-59.8		29	13,793	-60.9		26	13,325	-54.7		30	13,463	-55.1		20	13,995	-64.8		25	13,376	-55.9		30	13,922	-84.4	
125----	29	14,839	-62.6		28	14,914	-64.1		24	14,489	-56.0		29	14,614	-56.1		15	15,091	-69.4		22	14,537	-57.7		30	15,024	-68.5	
100----	27	16,201	-66.2		25	16,261	-67.1		23	15,902	-57.2		29	16,027	-58 1		9	16,400	-72.0		18	15,927	-58.6		28	16,345	-72.9	
80-----	25	17,557	-66.1		21	17,606	-68.2		20	17,307	-58.0		24	17,439	-57.8		7	17,698	-73.2		18	17,323	-59.1		25	17,651	-72.9	
60-----	24	19,310	-64.6		18	19,344	-66.0		15	19,113	-58.4		19	19,252	-57.4		5	29,404	-69.7		15	19,109	-59.8		15	19,363	-68.0	
50-----	19	20,437	-62.8		17	20,459	-64.5		12	20,219	-58.7		16	20,420	-56.6						8	20,265	-59.3		6	20,492	-65.9	
40-----	13	21,802	-61.4		14	21,824	-62.2						8	21,802	-57.9						5	21,663	-59.4					
30-----	9	23,587	-59.3		5	23,834	-59.5																					

	CAMAGUEY, CUBA (1005 MB.)				CARIBOU, ME. (994 MB.)				CHARLESTON, S. C. (1021 MB.)				COLUMBIA, MO. (992 MB.)				DODGE CITY, KANS. (926 MB.)				EL PASO, TEX. (884 MB.)				ELY, NEV. (807 MB.)			
SURFACE	31	122	19.8	93	31	191	-14.0	80	31	13	9.0	84	31	238	- 0.5	66	31	792	- 2.0	64	31	1,195	9.4	38	31	1,908	- 3.2	61
1000---	31	163	20.5	89	31	140	-17.7		31	182	12.1	69	31	168			31	174			31	149			31	166		
950----	31	610	19.7	79	31	535	-13.8	70	31	615	10.4	62	31	584	- .5	59	31	588			31	588			31	593		
900----	31	1,073	17.6	71	31	941	-13.7	64	31	1,060	8.7	59	31	1,012	- .2	55	31	1,023	- .1	53	31	1,043			31	1,031		
850----	31	1,560	14.8	63	31	1,376	-13.2	57	31	1,531	6.8	51	31	1,470	.6	52	31	1,484	3.7	44	31	1,518	10.9	28	31	1,494		
800----	31	2,071	12.3	53	31	1,837	-13.6	57	31	2,027	5.5	38	31	1,956	.1	43	31	1,977	4.1	36	31	2,020	8.1	28	31	1,980	- .9	57
750----	31	2,612	9.8	41	31	2,335	-14.6	54	31	2,560	3.3	35	31	2,479	- 1.9	38	31	2,502	1.8	32	31	2,559	5.6	26	31	2,500	- 1.9	55
700----	31	3,181	7.2	33	31	2,847	-16.3	52	31	3,109	.7	30	31	3,018	- 4.4	35	31	3,052	- 1.5	31	31	3,110	2.2		31	3,042	- 4.5	49
650----	30	3,796	4.3		31	3,412	-18.6	51	31	3,705	- 2.9	30	31	3,603	- 7.9	35	31	3,643	- 5.4	33	31	3,708	- 1.9		31	3,626	- 8.1	49
600----	28	4,435	.3		31	3,995	-21.4	50	31	4,329	- 6.6		30	4,219	-10.8	33	31	4,261	- 9.5	34	31	4,335	- 6.1		31	4,239	-12.0	48
550----	28	5,130	- 4.0		31	4,639	-25.2	48	31	5,007	-10.9		30	4,887	-15.4	35	31	4,929	-13.8	35	31	5,012	-10.8		31	4,900	-15.9	47
500----	28	5,873	- 9.0		31	5,317	-29.7	45	31	5,728	-16.0		30	5,595	-20.6	34	31	5,644	-18.9	36	31	5,736	-15.9		30	5,614	-20.4	47
450----	28	6,690	-14.8		31	6,071	-34.4		31	6,521	-22.0		30	6,376	-26.2		30	6,423	-25.1	38	31	6,525	-21.6	35	30	6,393	-25.9	44
400----	28	7,562	-21.6		31	6,875	-40.1	43	31	7,369	-28.2		30	7,207	-32.9		29	7,257	-31.9	39	31	7,379	-27.9	39	30	7,228	-32.2	44
350----	26	8,531	-28.7		30	7,772	-45.9		31	8,313	-35.1		30	8,132	-40.1		29	8,185	-38.9		31	8,323	-34.8	38	30	8,156	-39.4	
300----	26	9,616	-36.7		28	8,783	-51.2		31	9,369	-42.8		30	9,165	-47.8		28	9,228	-46.8		31	9,378	-42.8		29	9,192	-47.3	
250----	26	10,854	-45.5		28	9,957	-54.4		31	10,575	-50.7		30	10,346	-55.3		28	10,412	-54.8		31	10,583	-51.2		28	10,378	-55.2	
200----	26	12,311	-54.8		28	11,383	-54.7		31	12,004	-57.4		30	11,750	-59.5		26	11,818	-59.8		27	12,016	-58.0		28	11,784	-59.0	
175----	26	13,156	-59.4		28	12,238	-54.1		30	12,845	-58.8		30	12,587	-58.4		24	12,649	-59.1		27	12,852	-59.9		28	12,622	-58.6	
150----	26	14,110	-64.2		27	13,222	-53.9		30	13,805	-61.8		30	13,554	-69.2		23	13,609	-59.0		27	13,809	-62.1		26	13,587	-58.2	
125----	25	15,211	-69.3		25	14,390	-54.8		27	14,926	-65.4		30	14,690	-61.5		23	14,745	-61.6		26	14,920	-65.2		25	14,732	-59.2	
100----	20	16,514	-74.3		23	15,802	-56.4		26	16,274	-68.7		30	16,066	-63.3		22	16,123	-63.7		19	16,266	-88.5		24	16,121	-80.5	
80-----	16	17,816	-76.5		22	17,208	-57.8		23	17,604	-68.5		28	17,434	-64.5		20	17,483	-64.2		14	17,598	-69.1		22	17,499	-61.0	
80-----	13	19,480	-71.5		17	19,018	-58.9		18	19,332	-65.5		21	19,204	-63.0		18	19,241	-63.0		9	19,331	-66.8		15	19,301	-59.1	
50-----	13	20,569	-66.7		14	20,174	-60.0		17	20,448	-63.6		16	20,328	-61.9		14	20,356	-62.1		5	20,445	-85.1		12	20,456	-58.8	
40-----	11	21,936	-60.0		7	21,574	-60.9		11	21,823	-60.5		12	21,720	-61.6		9	21,749	-61.3						11	21,862	-57.8	
30-----	6	23,733	-55.3										6	23,542	-61.9										6	23,693	-56.9	

	GLASGOW, MONT. (941 MB.)				GRAND JUNCTION, COLO. (853 MB.)				GREAT FALLS, MONT. (884 MB.)				GREEN BAY, WIS. (994 MB.)				GREENSBORO, N. C. (990 MB.)				HATTERAS, N. C. (1021 MB.)				HILO, T. H. (1013 MB.)			
SURFACE	31	648	-16.6	67	31	1,474	- 0.5	68	31	1,128	-12.4		31	210	- 8.7	73	30	273	3.3	75	31	3	8.2	83	31	9	22.8	77
1000---	31	186			31	181			31	172			31	159	-15.0		30	188			31	173	9.3	73	31	117	21.8	78
950----	31	577	-24.4		31	607			31	575			31	561	- 8.2	70	30	610	5.2	61	31	599	7.3	62	31	565	18.3	81
900----	31	984	-14.2	63	31	1,045			31	992			31	977	- 9.1	66	30	1,048	4.5	55	31	1,041	5.4	59	31	1,023	15.3	81
850----	31	1,420	-11.3	59	31	1,505	.7	55	31	1,426	-10.3	55	31	1,419	- 9.0	56	30	1,513	3.1	45	31	1,506	3.4	50	31	1,508	12.5	78
800----	31	1,886	-10.1	56	31	1,994	.8	49	31	1,896	- 7.7	60	31	1,888	- 9.2	54	30	2,002	1.6	41	31	1,996	1.9	40	31	2,013	10.5	83
750----	31	2,388	-10.6	58	31	2,516	- 1.5	48	31	2,401	- 9.0	60	31	2,393	-10.7	52	30	2,527	.1	35	31	2,522	- .2	37	31	2,556	8.8	45
700----	31	2,912	-12.3	53	31	3,056	- 4.7	46	31	2,929	-11.4	57	31	2,914	-12.9	53	30	3,071	- 2.6	35	31	3,064	- 2.5	38	31	3,117	5.7	40
650----	31	3,482	-15.5	50	31	3,639	- 8.1	46	31	3,497	-15.3	56	31	3,485	-15.4	53	30	3,660	- 5.4	34	31	3,855	- 5.7	37	31	3,720	2.8	34
600----	31	4,074	-19.5	49	31	4,252	-12.0	45	31	4,093	-19.0	52	31	4,078	-18.4	49	30	4,279	- 9.2	34	31	4,272	- 9.3	34	31	4,383	- 1.1	
550----	31	4,717	-23.8	48	31	4,915	-16.3	46	31	4,733	-23.6	51	31	4,722	-22.3	50	30	4,952	-13.8		31	4,944	-13.4	31	30	5,052	- 5.2	
500----	31	5,404	-28.8	50	31	5,623	-20.8	48	31	5,424	-28.5	53	31	5,416	-27.1	51	30	5,665	-18.1	37	30	5,857	-18.4		30	5,794	- 9.7	
450----	31	6,154	-34.0	50	31	6,401	-26.2	45	31	6,171	-33.9	54	31	6,169	-32.1	49	30	8,450	-23.7	38	30	6,445	-23.8		30	8,606	-15.1	
400----	31	6,965	-39.5		31	7,234	-32.7	45	31	6,988	-39.5		31	6,989	-37.8		30	7,293	-29.9	39	30	7,286	-29.6		30	7,481	-21.3	
350----	29	7,866	-45.6		30	8,155	-39.6		30	7,884	-46.4		31	7,895	-44.1		29	8,226	-36.8	41	30	8,225	-38.6		30	8,451	-28.4	
300----	28	8,874	-51.7		30	9,189	-47.8		30	8,891	-52.9		31	8,913	-50.4		29	9,275	-44.4		30	9,275	-44.3		30	9,538	-35.9	
250----	25	10,019	-55.7		30	10,369	-55.4		29	10,048	-57.1		31	10,087	-55.3		29	10,475	-51.9		29	10,470	-52.1		30	10,780	-44.6	
200----	24	11,439	-55.8		30	11,774	-59.1		28	11,464	-55.7		31	11,502	-56.6		29	11,900	-57.6		29	11,896	-57.2		30	12,239	-54.9	
175----	24	12,289	-55.2		29	12,604	-57.5		27	12,327	-55.3		31	12,351	-55.4		29	12,742	-57.5		29	12,740	-57.4		29	13,084	-60.3	
150----	22	13,278	-54.7		29	13,577	-57.7		27	13,308	-55.6		30	13,338	-55.5		29	13,714	-58.3		29	13,711	-59.2		25	14,032	-66.0	
125----	22	14,442	-55.3		29	14,722	-60.1		26	14,468	-57.0		24	14,505	-56.6		28	14,851	-61.0		26	14,843	-82.9		24	15,121	-72.0	
100----	21	15,854	-55.5		28	16,109	-62.4		25	15,884	-56.8		23	15,917	-58.3		25	16,222	-83.3		25	16,214	-65.3		15	18,422	-77.0	
80-----	19	17,270	-55.3		25	17,493	-63.6		23	17,291	-57.1		19	17,331	-58.6		24	17,585	-64.5		24	17,587	-85.9		7	17,704	-77.8	
60-----	13	19,110	-54.3		17	19,268	-61.6		21	19,112	-56.5		16	19,140	-59.8		18	19,349	-62.2		19	19,329	-63.6					
50-----	10	20,283	-54.9		9	20,423	-61.3		19	20,276	-57.0		10	20,280	-61.2		18	20,478	-61.8		17	20,444	-62.5					
40-----	5	21,759	-55.0						11	21,733	-57.4		7	21,662	-61.5		13	21,873	-60.6		13	21,829	-81.1					
30-----									6	23,587	-55.8						9	23,647	-59.2		5	23,641	-59.3					

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

JANUARY 1954

	INTERNAT. FALLS, MINN. (976 MB.)				LAKE CHARLES, LA. (1021 MB.)				LANDER, WYO. (825 MB.)				LAS VEGAS, NEV. (940 MB.)				LITTLE ROCK, ARK. (1012 MB.)				MAZATLAN, MEXICO (1011 MB.)				MEDFORD, ORE. (968 MB.)			
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	360	-19.1	66	31	5	12.3	82	31	1,696	- 2.2	62	31	660	6.9	47	31	79	5.3	71	31	14	21.3	81	31	401	4.3	89
1,000--	30	175			31	182	12.9	73	31	132			31	142			31	175	6.1	65	31	111	20.9	76	31	133		
950----	30	561	-18.3	68	31	615	11.8	67	31	555			31	571			31	601	5.6	62	31	572	23.8	38	31	555	4.8	77
900----	30	963	-16.6	70	31	1,065	10.9	59	31	995			31	1,018	9.1	39	31	1,038	6.4	59	31	1,029	21.5	33	31	993	3.0	73
850----	30	1,393	-15.0	67	31	1,541	9.7	51	31	1,453			31	1,489	6.4	40	31	1,507	6.1	55	31	1,521	18.6	30	31	1,454	.4	73
800----	30	1,852	-14.3	63	31	2,042	7.8	51	31	1,938	- .5	50	31	1,984	3.8	39	31	2,002	4.9	51	31	2,037	15.0	32	31	1,938	- 2.3	72
750----	30	2,344	-15.4	59	31	2,580	5.7	41	31	2,455	- 3.1	48	31	2,512	1.3	35	31	2,533	2.6	43	31	2,589	11.2	39	31	2,454	- 4.7	69
700----	30	2,861	-16.9	57	31	3,135	3.3	32	31	2,993	- 6.6	48	31	3,058	- 1.3	34	31	3,081	- .3	41	31	3,151	7.0	43	31	2,989	- 7.5	65
650----	30	3,420	-19.5	53	31	3,735	- .1		31	3,575	- 9.9	47	31	3,652	- 4.8	31	31	3,674	- 3.7	40	30	3,761	2.6	45	31	3,569	-10.8	62
600----	28	4,003	-23.0	50	30	4,368	- 3.8		31	4,182	-13.3	43	31	4,271	- 8.4		31	4,298	- 7.8	40	29	4,399	- 1.5		31	4,174	-14.5	54
550----	28	4,636	-26.9	50	30	5,048	- 8.5		31	4,841	-17.7	41	31	4,944	-13.2	32	31	4,972	-12.3	39	28	5,089	- 5.8		31	4,832	-18.4	51
500----	28	5,316	-31.4	50	30	5,780	-13.7		31	5,544	-22.7	39	31	5,658	-18.7	34	31	5,690	-17.5	38	28	5,826	-10.6		31	5,533	-23.1	49
450----	28	6,058	-36.2		29	6,577	-19.4		31	6,314	-28.6	39	31	6,440	-24.7	36	31	6,476	-23.1		28	6,635	-15.9		31	8,301	-28.0	47
400----	28	6,862	-41.6		29	7,436	-25.8		31	7,140	-34.9	40	31	7,281	-31.3	34	31	7,322	-29.2		28	7,506	-22.2		31	7,130	-34.3	50
350----	27	7,758	-47.5		29	8,388	-33.1		31	8,057	-42.0		31	8,211	-38.7		31	8,261	-36.5		28	8,473	-29.5		31	8,051	-41.0	
300----	26	8,763	-52.6		29	9,452	-41.3		31	9,082	-49.7		31	9,249	-46.5		31	9,311	-44.7		28	9,555	-37.6		31	9,081	-48.4	
250----	26	9,929	-55.5		28	10,666	-49.9		31	10,255	-56.1		30	10,446	-54.2		30	10,519	-52.3		25	10,788	-47.3		31	10,262	-54.7	
200----	26	11,351	-54.7		27	12,100	-57.6		31	11,663	-58.4		30	11,852	-59.8		30	11,941	-57.8		16	12,223	-57.3		28	11,678	-57.7	
175----	26	12,207	-53.9		27	12,935	-60.9		30	12,507	-57.8		30	12,686	-59.0		30	12,779	-58.8		13	13,050	-60.3		27	12,520	-56.4	
150----	26	13,194	-54.2		26	13,887	-63.2		30	13,481	-56.9		28	13,647	-58.7		29	13,741	-59.9		8	13,990	-64.7		26	13,497	-55.9	
125----	24	14,363	-55.1		24	14,995	-66.6		28	14,632	-57.7		28	14,784	-61.3		27	14,868	-63.0		6	15,085	-68.6		22	14,654	-57.6	
100----	22	15,784	-55.9		21	16,337	-70.2		27	16,041	-58.2		27	16,162	-64.2		24	16,225	-66.8						17	16,064	-57.8	
80-----	21	17,188	-56.2		19	17,654	-71.9		27	17,441	-58.8		24	17,526	-64.5		21	17,576	-66.8						10	17,458	-58.0	
60-----	11	19,062	-56.9		16	19,352	-68.3		21	19,244	-57.3		22	19,295	-62.9		16	19,308	-64.4						8	19,238	-57.4	
50-----	5	20,290	-55.1		16	20,451	-65.5		19	20,402	-57.2		18	20,413	-61.9		13	20,438	-63.7						7	20,375	-58.4	
40-----					11	21,817	-62.4		14	21,815	-56.6		12	21,787	-80.8		7	21,813	-61.7						5	21,774	-57.6	
30-----					7	23,601	-60.2		8	23,614	-56.4		5	23,571	-58.8													

	MIAMI, FLA. (1021 MB.)				MIDLAND, TEX. (918 MB.)				NANTUCKET,MASS. (1016 MB.)				NASBVILLE, TENN. (1001 MB.)				NORTH PLATTE, NEHR. (918 M8.)				OAKLAND, CALIF. (1018 MB.)				OKLAHOMA CITY, OKLA. (974 MB.)			
SURFACE	31	4	19.6	78	31	871	7.4	54	31	14	0.1	79	31	177	4.7	79	31	849	- 5.7	72	31	6	9.8	80	31	391	2.7	69
1,000--	31	182	19.6	73	31	156			31	139	.3	74	31	180	1.6	71	31	165			31	155	9.9	73	31	171		
950----	31	621	17.0	73	31	587			31	551	- 1.7	75	31	601	4.3	64	31	578			31	581	7.5	69	31	592	4.1	60
900----	31	1,082	14.0	72	31	1,037	9.8	45	31	978	- 3.3	73	31	1,039	3.8	58	31	1,002	- 3.5	60	31	1,023	5.4	63	31	1,029	5.3	55
850----	31	1,562	11.7	59	31	1,512	11.0	32	31	1,430	- 3.5	62	31	1,503	3.8	50	31	1,456	- .7	46	31	1,488	3.5	54	31	1,497	6.5	42
800----	31	2,068	10.6	35	31	2,015	8.7	29	31	1,908	- 4.9	58	31	1,995	2.4	45	31	1,941	.6	40	31	1,979	2.0	43	31	1,994	5.9	32
750----	31	2,608	8.4		31	2,553	6.2	24	31	2,417	- 7.0	53	31	2,521	.5	41	31	2,461	- 1.5	37	31	2,503	- .8	41	31	2,527	3.1	31
700----	31	3,171	6.0		31	3,109	3.0	25	31	2,949	- 9.3	47	31	3,065	- 2.2	41	31	3,003	- 4.7	40	31	3,045	- 3.8	41	31	3,075	.1	31
650----	31	3,776	2.8		31	3,707	- .8	25	31	3,524	-12.1	44	31	3,655	- 5.1	39	31	3,586	- 8.1	40	31	3,633	- 6.8	42	31	3,669	- 3.5	32
600----	31	4,417	- 1.1		31	4,339	- 5.1		31	4,127	-15.4	40	30	4,272	- 9.0	40	31	4,199	-12.4	43	31	4,247	-10.5	41	31	4,292	- 7.7	33
550----	31	5,103	- 5.6		31	5,015	- 9.8		31	4,780	-19.3	40	30	4,945	-13.5	43	30	4,860	-16.8	43	31	4,913	-15.0	41	31	4,966	-12.1	33
500----	31	5,846	-10.7		31	5,745	-15.1		31	5,481	-23.9	40	30	5,658	-18.4	39	30	5,568	-21.7	42	31	5,625	-19.9	40	31	5,684	-17.5	34
450----	31	6,655	-16.6		31	6,538	-20.9		31	6,247	-29.0	41	30	6,444	-24.1	39	30	6,342	-27.1	41	31	6,405	-25.4	39	31	6,470	-23.5	
400----	31	7,522	-23.0		30	7,394	-27.4		31	7,074	-34.9		29	7,285	-30.4	40	30	7,173	-33.3	37	31	7,242	-31.9	39	31	7,313	-30.0	35
350----	31	8,485	-30.4		30	8,340	-34.3		31	7,992	-41.5		29	8,221	-37.2		30	8,095	-40.9		30	8,171	-39.1		31	8,248	-37.3	
300----	30	9,559	-38.9		29	9,399	-42.3		31	9,023	-47.5		29	9,258	-44.7		30	9,124	-48.9		30	9,209	-47.0		30	9,294	-44.4	
250----	30	10,782	-48.0		28	10,600	-50.2		31	10,209	-53.5		29	10,466	-52.5		30	10,298	-56.8		30	10,395	-54.7		30	10,491	-52.2	
200----	30	12,220	-57.2		28	12,032	-57.5		31	11,635	-55.5		29	11,889	-57.5		29	11,697	-60.1		30	11,801	-59.3		30	11,911	-58.1	
175----	30	13,056	-61.0		28	12,870	-59.7		31	12,485	-55.5		28	12,736	-58.1		29	12,533	-58.5		28	12,639	-58.6		30	12,748	-59.4	
150----	29	14,000	-65.4		28	13,827	-61.7		31	13,467	-55.6		27	13,702	-59.3		27	13,500	-58.5		28	13,610	-58.0		30	13,711	-59.9	
125----	29	15,097	-69.4		28	14,950	-64.1		29	14,623	-57.7		25	14,840	-61.8		24	14,645	-59.4		28	14,753	-60.0		29	14,839	-63.0	
100----	27	16,415	-73.8		27	16,303	-67.3		27	16,020	-59.4		22	16,207	-64.8		23	16,033	-61.5		24	16,128	-61.7		27	16,198	-65.6	
80-----	20	17,709	-74.2		26	17,644	-68.2		23	17,415	-59.5		19	17,563	-64.5		19	17,411	-61.7		24	17,505	-62.3		19	17,561	-66.6	
60-----	15	19,401	-68.5		15	19,382	-66.3		18	19,200	-60.0		17	19,331	-63.9		16	19,191	-61.1		23	19,282	-61.3		11	19,309	-63.4	
50-----	13	20,496	-64.4		8	20,500	-64.0		17	20,336	-60.0		12	20,448	-62.6		9	20,342	-60.5		21	20,420	-59.9		6	20,426	-62.5	
40-----	10	21,869	-60.2						15	21,739	-59.6		5	21,842	-60.9						12	21,811	-58.7					
30-----									7	23,557	-60.0										5	23,685	-57.1					

	OMABA, NEBR. (985 MB.)				PHOENIX, ARIZ. (977 MB.)				PITTSBURGB, PA. (975 M8.)				PORTLAND, ME. (1016 MB.)				RAPID CITY, S. DAK. (903 MB.)				ST. CLOUD, MINN. (981 MB.)				SAN ANTONIO, TEX. (992 MB.)			
SURFACE	31	300	- 6.9	66	31	338	11.4	57	31	382	- 1.1	71	31	20	- 7.9	77	31	966	- 7.5	63	31	316	-15.2	71	31	243	12.1	71
1,000--	31	181			31	147			31	171			31	140	- 7.0	68	31	161			31	168			31	173		
950----	31	586	- 6.7	60	31	583	14.8	35	31	586	- 1.3	68	31	543	- 7.5	66	31	567			31	562	-13.7	69	31	605	12.7	66
900----	31	1,006	- 4.8	56	31	1,035	12.5	30	31	1,010	- 2.7	66	31	960	- 7.8	64	31	994	- 8.4	60	31	969	-11.0	66	31	1,058	11.6	66
850----	31	1,458	- 1.6	46	31	1,512	9.6	28	31	1,462	- 3.8	63	31	1,405	- 7.8	61	31	1,444	- 3.9	51	31	1,410	- 8.6	56	31	1,535	10.4	55
800----	31	1,941	- 1.0	38	31	2,011	6.7	30	31	1,939	- 5.5	59	31	1,875	- 8.4	56	31	1,923	- 4.1	51	31	1,880	- 8.5	50	31	2,039	9.4	37
750----	31	2,459	- 2.8	33	31	2,545	3.6	30	31	2,452	- 6.8	56	31	2,381	- 9.5	54	31	2,434	- 4.2	50	31	2,385	- 9.9	46	31	2,578	7.2	31
700----	31	2,999	- 5.4	32	31	3,095	.5	30	31	2,981	- 9.0	49	31	2,905	-12.0	49	31	2,973	- 7.0	48	31	2,910	-12.1	48	31	3,136	3.9	30
650----	31	3,581	- 9.0	34	31	3,694	- 3.1		31	3,562	-11.7	44	31	3,476	-14.7	47	31	3,550	-10.5	50	31	3,481	-15.2	42	31	3,736	.2	
600----	31	4,192	-12.7	37	31	4,314	- 7.3		31	4,160	-14.5	44	31	4,071	-18.0	46	31	4,158	-14.6	49	31	4,074	-18.7	41	30	4,370	- 3.6	
550----	31	4,852	-16.8	40	31	4,990	-12.2	31	31	4,821	-18.4	42	31	4,719	-21.8	44	31	4,813	-18.8	46	31	4,722	-22.7	40	30	5,054	- 8.2	
500----	31	5,560	-21.5	38	31	5,708	-17.1		31	5,519	-22.9	42	31	5,412	-26.3	40	31	5,514	-23.8	45	31	5,410	-27.0	39	30	5,786	-13.1	
450----	31	6,335	-27.1	38	31	6,499	-22.9		31	6,293	-28.3	41	31	6,169	-31.7	41	31	6,277	-29.1	43	31	6,168	-32.0		30	6,586	-19.0	
400----	31	7,166	-33.6	40	31	7,342	-28.9		31	7,117	-34.1	44	31	6,989	-37.2		31	7,105	-35.5	46	31	6,984	-37.7		30	7,446	-25.6	
350----	31	8,088	-41.0		30	8,278	-36.2		31	8,037	-40.7		30	7,897	-43.2		30	8,011	-42.7		31	7,891	-44.4		30	8,399	-32.7	42
300----	31	9,117	-48.9		30	9,328	-44.1		31	9,069	-47.4		30	8,922	-48.0		30	9,034	-50.3		31	8,908	-51.3		30	9,467	-40.7	
250----	30	10,291	-56.5		30	10,528	-52.2		29	10,253	-53.5		29	10,108	-52.9		30	10,204	-56.9		31	10,076	-56.5		30	10,685	-49.0	
200----	29	11,695	-58.9		30	11,951	-57.3		27	11,674	-56.7		28	11,545	-54.7		30	11,607	-58.1		31	11,489	-56.1		30	12,120	-57.8	
175----	29	12,535	-57.7		30	12,793	-57.9		25	12,518	-55.4		26	12,393	-54.1		30	12,452	-56.3		30	12,344	-54.9		30	12,955	-60.8	
150----	29	13,509	-57.3		30	13,762	-59.3		21	13,507	-56.1		26	13,380	-54.3		27	13,434	-55.3		30	13,328	-55.3		28	13,917	-63.4	
125----	27	14,657	-58.7		30	14,895	-62.5		19	14,654	-57.5		23	14,542	-54.5		27	14,594	-56.0		29	14,491	-56.4		28	15,026	-67.1	
100----	26	16,053	-60.4		28	16,261	-65.4		18	16,045	-60.1		22	15,963	-55.9		26	16,005	-57.3		27	15,914	-57.6		23	16,362	-70.6	
80-----	20	17,451	-60.8		25	17,613	-65.6		15	17,452	-60.1		17	17,369	-55.8		24	17,417	-58.7		25	17,326	-57.9		16	17,669	-71.4	
60-----	15	19,247	-60.2		20	19,359	-64.0		13	19,252	-61.0		13	19,187	-57.6		23	19,234	-58.4		12	19,134	-59.2		14	19,383	-68.6	
50-----	13	20,393	-60.6		19	20,482	-62.4		11	20,386	-60.9		9	20,351	-56.9		19	20,389	-57.6		5	20,304	-58.5		11	20,478	-66.4	
40-----	6	21,810	-61.2		16	21,873	-60.3		10	21,769	-60.5		8	21,748	-55.5		9	21,794	-58.4						8	21,836	-63.5	
30-----	5	23,600	-61.3		8	23,705	-58.1						5	23,575	-54.5										5	23,624	-59.1	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

JANUARY 1954

Standard pressure surface (mb.)	SAN JUAN, P. R. (1016 MB.)				SANTA MARIA, CALIF. (1010 M8.)				S. STE. MARIE, MICH. (992 MB.)				SPOKANE, WASH. (928 MB.)				SWAN ISLANO, W. I. (1016 MB.)				TACUBAYA, MEXICO (775 MB.)				TAMPA, FLA. (1022 M8.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	19	23.3	79	31	71	9.2	85	31	221	-10.8	82	31	722	- 2.6	81	28	10	25.3	79	15	2,306	14.7		31	9	15.0	82
1,000--	31	157	23.4	75	31	154	10.3	79	31	161	-14.7		31	123			28	146	24.8	76	15	80			31	191	16.5	72
950----	31	602	20.2	78	31	582	9.6	65	31	559	-11.5	69	31	536			28	595	21.3	80	15	540			31	628	14.7	65
900----	31	1,068	16.9	79	31	1,028	8.0	53	31	970	-11.9	72	31	964	- 2.6	74	28	1,062	17.9	77	15	1,019			31	1,083	13.0	52
850----	31	1,554	13.6	77	31	1,497	6.2	43	31	1,405	-13.0	71	31	1,416	- 4 0	69	28	1,549	15.2	66	15	1,506			31	1,561	10.8	45
800----	31	2,063	11.5	58	31	1,992	3.9	36	31	1,867	-13.3	64	31	1,893	- 6.1	67	28	2,060	12.5	55	15	2,039			31	2,065	9.7	
750----	31	2,602	9.8	41	31	2,518	1.6	32	31	2,358	-14.1	55	31	2,400	- 8.8	65	28	2,605	10.4	37	15	2,587	13.4		31	2,605	7.6	
700----	31	3,172	7.5	32	31	3,067	- 1.1		31	2,879	-16 0	52	31	2,927	-12.1	66	28	3,172	8.0		15	3,154	9.0		31	3,163	5.0	
650----	31	3,782	4.2		31	3,658	- 4.4	33	31	3,439	-18.6	51	31	3,497	-15.6	62	28	3,786	4.9		15	3,767	4.2		31	3,770	2.0	
600----	31	4,425	.5		31	4,280	- 8.4		31	4,027	-21.8	53	31	4,089	-19.3	58	28	4,428	1.1		15	4,408	- .7		31	4,405	- 2.0	
550----	31	5,118	- 3.8		31	4,951	-12.9	32	31	4,662	-25.3	56	31	4,734	-23.4	54	28	5,126	- 2.9		15	5,106	- 3.0		31	5,096	- 6.8	
500----	31	5,862	- 9.0		31	5,669	-18.2	35	31	5,348	-29.7	58	31	5,421	-27.9	52	28	5,871	- 7.5		13	5,850	- 6.9		31	5,827	-11.8	
450----	31	6,679	-14.6		31	6,455	-24.0	36	31	6,096	-34.9	58	31	6,176	-33.2	50	28	6,690	-13.1		12	6,673	-12.6		31	6,635	-17.5	
400----	31	7,550	-21.2		31	7,296	-30.6	35	30	6,902	-40.6		31	6,988	-38.8	53	28	7,570	-19.3		12	7,555	-19.2		31	7,496	-24.0	32
350----	30	8,519	-27.5		30	8,229	-38.0		30	7,799	-46.4		31	7,891	-45.0		28	8,547	-26.9		12	8,533	-27.3		31	8,455	-31.5	
300----	30	9,611	-34.8		30	9,273	-45.6		29	8,814	-51.7		31	8,905	-51.4		28	9,639	-35.3		10	9,627	-35.7		31	9,527	-39.5	
250----	30	10,857	-43.9		30	10,463	-54.3		28	9,985	-55.4		31	10,076	-55.6		28	10,884	-44.5		8	10,873	-45.6		30	10,748	-48.5	
200----	29	12,320	-54.3		30	11,874	-59.0		26	11,388	-54.8		29	11,495	-53.9		27	12,342	-54.7						30	12,186	-56.9	
175----	29	13,164	-60.0		30	12,712	-58.3		20	12,257	-53.2		27	12,348	-51.7		27	13,186	-59.8						30	13,025	-59.7	
150----	29	14,111	-65.6		30	13,678	-59 4		16	13,252	-53.5		27	13,346	-51.8		25	14,137	-65.2						29	13,979	-63.3	
125----	29	15,202	-71.2		30	14,814	-61.6		13	14,421	-55.2		26	14,518	-53.1		23	15,236	-69.8						28	15,086	-68.1	
100----	29	16,502	-76.5		28	16,181	-64.5		10	15,821	-56.7		24	15,940	-54.2		21	16,541	-75.9						28	16,411	-71.9	
80-----	27	17,775	-78.7		28	17,544	-64.0		6	17,215	-57.2		22	17,377	-53.9		19	17,818	-78.3						24	17,723	-72.6	
60-----	25	19,434	-72.3		25	19,314	-62.2						17	19,214	-53.5		18	19,484	-71.0						23	19,414	-70.3	
50-----	25	20,519	-67.6		23	20,447	-61.3						13	20,388	-53.0		18	20,576	-65.5						19	20,497	-67.2	
40-----	21	21,886	-61.6		18	21,823	-59.8						7	21,846	-54.9		16	21,957	-59.5						17	21,846	-63.3	
30-----	21	23,681	-58.5		8	23,615	-58.6										15	23,769	-56.8						13	23,643	-57.7	
20-----	10	26,238	-56.0														7	26,363	-52.3						6	26,255	-53.8	

	TATOOSH ISLAND, WASH. (1006 MB.)				VERACRUZ, MEXICO (1016 MB.)				WASHINGTON, O. C. (1010 M8.)			
SURFACE	31	31	3.9	82	31	13	22.5	81	31	88	1.1	64
1,000--	31	78	4.1	77	31	147	21.5	81	31	171	1.8	61
950----	31	497	1.3	77	31	588	19.2	75	31	590	.3	63
900----	31	927	- 1.3	74	31	1,055	16.9	78	31	1,017	- .5	63
850----	31	1,380	- 4.1	76	31	1,541	14.7	63	31	1,473	- 1.4	60
800----	31	1,856	- 6.9	73	31	2,052	11.9	63	31	1,956	- 2.1	54
750----	31	2,364	- 9.4	63	31	2,593	9.3	55	31	2,473	- 4.1	48
700----	31	2,887	-12.6	59	30	3,159	6.7	42	31	3,008	- 7.0	46
650----	31	3,456	-16.2	56	29	3,768	3.3	37	31	3,590	- 9.7	44
600----	31	4,047	-20.1	56	26	4,408	.6		31	4,198	-12.7	41
550----	31	4,688	-24.1	53	26	5,102	- 3.0		30	4,864	-16.9	43
500----	31	5,376	-28.6	51	25	5,851	- 7.7		30	5,564	-21.6	43
450----	30	6,124	-33.3	48	23	6,673	-13.3		30	6,341	-26.9	41
400----	30	6,935	-38.3		21	7,550	-19.8		30	7,172	-32.7	
350----	30	7,843	-43.7		19	8,527	-27.2		29	8,107	-39.3	
300----	30	8,864	-49.5		15	9,612	-36.0		29	9,146	-46.4	
250----	29	10,053	-52.7		12	10,851	-45.8		29	10,336	-53.7	
200----	28	11,489	-53.7		11	12,302	-57.0		29	11,753	-57.3	
175----	28	12,348	-52.6		8	13,127	-62.7		28	12,607	-56.9	
150----	27	13,332	-52.4		6	14,066	-68.0		26	13,576	-57.3	
125----	27	14,509	-52.8		5	15,162	-71.4		25	14,718	-60.0	
100----	26	15,938	-53.9						22	16,095	-61.9	
80-----	23	17,364	-53.9						20	17,465	-62.4	
60-----	17	19,213	-53.5						17	19,236	-61.8	
50-----	15	20,365	-53.5						16	20,366	-60.9	
40-----	10	21,793	-54.9						14	21,765	-60.4	
30-----									9	23,550	-60.1	

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T., "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Table 21 JANUARY 1954

Altitude (meters) m.s.l.	Ahilene, Tex. (534 m.)			Alhuquerque, N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	29	231	1.7	31	90	0.2	27	259	2.4	31	291	1.6	30	145	2.0	31	131	4.0
500	--	---	----	--	---	----	--	---	----	--	---	----	--	---	----	29	151	5.5
1,000	27	234	3.8	--	---	----	--	---	----	29	289	4.7	30	164	2.6	21	171	3.5
1,500	25	251	6.3	--	---	----	27	241	6.6	27	283	6.6	30	220	4.0	18	213	2.8
2,000	23	256	8.9	31	226	1.9	26	360	10.3	25	360	9.0	30	251	6.7	18	225	5.3
2,500	23	270	9.6	29	276	5.4	25	271	11.2	23	285	12.2	21	270	7.3	18	229	6.7
3,000	22	258	10.7	28	281	8.7	24	273	12.1	21	290	15.3	18	270	8.9	17	247	5.1
4,000	20	263	13.6	28	278	12.7	17	275	14.3	15	297	22.9	15	271	9.3	11	257	5.7
5,000	18	272	13.6	28	272	15.6	13	283	15.2	13	296	27.2	14	280	13.3	11	253	8.2
6,000	17	273	15.5	28	267	18.0	11	270	18.2				10	291	12.8	10	268	10.5
8,000	13	270	22.0	19	278	16.7												
10,000				14	276	20.3												
12,000																		
14,000																		

Altitude (meters) m.s.l.	Buffalo, N. Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S. C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)			Ely, Nev. (1,910 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	25	270	1.1	26	270	0.3	29	265	2.0	26	251	2.2	31	270	1.9	29	180	2.8
500	25	270	2.2	26	270	1.9	28	246	3.8	26	250	3.3	--	---	----	--	---	----
1,000	19	255	5.1	21	269	5.1	27	256	5.1	19	259	6.6	--	---	----	--	---	----
1,500	13	279	8.3	16	282	7.7	23	270	7.7	18	271	9.7	31	241	2.5	--	---	----
2,000	10	279	10.4	15	286	11.6	18	282	11.5	15	287	10.7	31	249	4.5	29	270	.1
2,500				15	270	14.1	15	289	12.1	14	297	13.0	29	257	6.8	29	270	2.1
3,000				14	284	16.7	15	288	14.8	14	300	15.4	29	264	7.5	29	247	8.1
4,000				13	274	22.8	13	270	16.1				28	261	11.7	27	266	9.7
5,000				11	280	25.9							28	259	13.8	21	276	12.7
6,000													24	270	15.7	18	270	16.7
8,000													20	268	18.8			
10,000													17	272	23.4			
12,000													13	275	31.7			
14,000													11	273	29.9			

Altitude (meters) m.s.l.	Grand Junction, Colo. (1,475 m.)			Green Bay, Wis. (210 m.)			Greensboro, N. C. (271 m.)			Bavre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Little Rock, Ark. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	298	1.4	30	275	1.7	24	272	3.1	29	301	1.0	29	318	0.6	22	185	0.9
500	--	---	----	30	270	2.8	24	263	4.1	--	---	----	28	246	2.5	22	270	1.0
1,000	--	---	----	25	279	4.5	22	269	7.5	29	265	3.6	28	251	5.6	18	296	4.7
1,500	31	299	1.4	19	279	7.1	21	279	10.0	25	265	9.3	26	261	7.6	18	288	8.6
2,000	31	270	1.2	16	276	11.0	19	291	13.2	22	270	11.9	23	267	9.2	17	283	10.7
2,500	31	210	4.4	15	277	13.9	19	285	16.1	17	276	12.8	20	275	10.4	17	270	11.8
3,000	28	228	7.6	12	282	16.0	17	282	18.5	14	283	12.4	20	281	11.4	16	279	13.9
4,000	24	264	12.4	11	287	19.9	15	280	19.8				19	278	16.1	11	283	13.7
5,000	22	269	15.6				15	280	22.5				16	282	18.9			
6,000	17	360	16.8				12	283	25.1				12	278	21.0			
8,000	14	270	21.8															

Altitude (meters) m.s.l.	Medford, Ore. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			Oakland, Calif. (8 m.)			Omaha, Nebr. (306 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	26	234	0.4	31	91	2.4	27	69	0.9	25	238	1.0	30	193	1.8	31	270	1.0
500	26	210	.3	31	94	2.1	27	236	.6	25	230	2.3	29	230	1.8	31	270	1.8
1,000	25	187	3.2	30	90	.4	25	301	2.8	19	180	4.8	23	287	1.5	27	266	3.4
1,500	22	213	5.2	27	256	2.0	19	300	5.1	17	281	9.2	21	301	2.1	26	282	6.8
2,000	17	226	6.9	24	259	4.2	18	300	5.7	16	288	11.5	19	270	2.1	22	281	10.1
2,500	11	270	6.5	21	265	6.8	17	300	8.0	16	270	13.3	17	308	3.6	20	289	12.9
3,000	10	243	9.5	20	273	8.6	15	297	9.6	15	290	16.3	17	303	4.3	20	291	14.4
4,000				18	273	9.2	13	288	12.5	11	286	19.7	17	286	7.0	18	291	17.6
5,000				15	272	15.6	12	281	15.5	10	289	22.1	15	279	9.9	13	284	18.4
6,000				12	265	17.7				10	291	24.9	12	270	14.1	11	270	19.9
8,000																		

Altitude (meters) m.s.l.	Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	105	0.4	31	9	2.0	29	321	1.3	26	270	1.1	27	177	1.0
500	31	105	.8	--	---	----	29	270	1.5	26	270	2.5	27	174	.8
1,000	31	107	1.3	31	8	1.9	27	263	3.5	23	272	5.1	25	197	2.5
1,500	30	165	1.5	31	278	4.3	22	290	7.8	21	278	6.5	21	241	4.3
2,000	29	270	1.7	27	270	8.8	20	287	9.4	21	280	8.9	20	266	7.2
2,500	28	251	4.1	25	282	12.3	18	287	12.8	19	270	10.2	18	267	9.3
3,000	28	247	5.7	24	284	14.6	18	285	15.9	17	296	12.8	18	267	11.2
4,000	25	261	8.0	18	288	17.0	16	290	21.7	15	293	15.7	17	262	13.0
5,000	25	268	10.0	15	291	21.0	14	285	26.6	13	293	20.8	15	267	15.6
6,000	25	270	12.7	11	288	23.6	10	360	29.1	13	293	24.9	15	261	18.4
8,000	14	270	13.1												
10,000	11	276	16.6												
12,000															
14,000															
16,000															

Altitude (meters) m.s.l.	San Diego, Calif. (13 m.)			* Sault Ste. Marie, Mich. (221 m.)			Seattle, Wasb. (116 m.)			Spokane, Wasb. (725 m.)			† Washington, D. C. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	28	285	2.4	30	270	0.1	21	270	0.5	25	270	1.1	31	281	2.1
500	27	319	2.6	30	270	1.4	21	209	4.3	--	---	----	30	271	4.2
1,000	24	356	.9	30	270	4.4	16	216	6.0	25	214	5.2	30	273	7.6
1,500	23	318	1.3	30	281	7.4	10	250	5.6	19	234	7.7	30	270	10.7
2,000	22	360	3.4	30	285	9.6				15	245	8.3	31	282	13.3
2,500	22	293	5.2	30	360	11.4				13	360	11.4	31	270	15.1
3,000	22	277	5.4	30	282	13.8				13	255	11.2	31	282	17.0
4,000	19	273	7.6	30	283	18.5							31	279	20.5
5,000	19	272	8.5	30	284	21.8							31	276	24.7
6,000	15	270	11.4	29	270	26.3							31	275	28.8
8,000	11	281	12.5	26	280	33.9							30	360	35.8
10,000	11	280	13.7	24	279	40.7							29	275	42.3
12,000				19	283	33.8							29	274	44.7
14,000				15	285	28.8							26	274	39.3
16,000				10	288	26.1							25	271	31.8

* Rawin Data

† Rawin Data (cont'd)

18,000 m., 16 obs., 270 dir., 20.4 speed
20,000 m., 10 obs., 262 dir., 15.0 speed

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

RAWIN DATA

Average monthly resultant winds

Table 22

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S. C. (13 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	99	1.5	31	4	1.1	31	117	2.9	31	69	1.8	31	306	2.8	31	248	0.7
500	--	---	----	--	---	----	31	156	6.9	31	141	1.4	30	311	3.5	30	248	4.0
1,000	--	---	----	30	270	4.3	30	173	5.8	30	228	2.1	30	309	4.2	30	251	6.5
1,500	--	---	----	30	296	8.2	30	196	4.4	29	254	2.6	30	294	6.4	30	263	8.0
2,000	31	278	2.4	31	295	10.4	29	215	4.5	28	254	4.0	30	277	7.8	30	266	9.7
2,500	31	360	6.0	31	270	12.6	28	233	5.0	28	180	5.5	29	272	9.0	30	270	12.1
3,000	31	277	8.9	30	289	16.2	28	247	5.5	27	258	7.7	27	262	10.1	30	274	14.1
4,000	31	276	12.2	28	287	20.2	27	258	7.2	27	257	11.4	26	262	13.3	28	276	16.2
5,000	30	274	15.4	24	281	23.9	23	257	9.2	27	260	14.1	23	265	16.0	23	278	18.2
6,000	29	270	18.8	18	287	24.9	22	270	11.3	27	270	16.0	17	257	10.4	21	282	19.7
8,000	17	270	16.1				19	256	17.5	24	267	22.9	12	260	10.5	14	270	22.5
10,000	13	282	19.3				14	268	23.5	19	272	25.7	10	253	12.7			
12,000										14	271	27.5						
14,000										12	264	28.9						
16,000																		
18,000																		
20,000																		

Altitude (meters) m.s.l.	Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N. C. (275 m.)			Hatteras, N. C. (3 m.)			Int. Falls, Minn. (358 m.)			Little Rock, Ark. (80 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	274	0.7	31	86	0.5	30	280	1.5	31	269	2.3	30	317	1.1	31	231	0.2
500	31	246	3.2	--	---	----	30	258	4.6	27	285	6.5	29	272	1.1	31	242	3.5
1,000	31	261	7.0	--	---	----	30	260	7.9	26	281	8.7	28	267	2.7	31	243	5.8
1,500	31	265	9.8	31	90	.4	30	263	10.0	26	280	10.0	26	281	4.9	30	250	9.7
2,000	31	275	11.5	31	204	1.2	29	270	12.3	27	273	11.1	26	287	7.4	29	259	10.8
2,500	31	281	12.8	31	270	1.8	28	275	13.8	27	272	13.8	26	360	10.1	26	274	10.9
3,000	31	281	14.8	31	237	7.5	27	277	16.6	27	275	17.0	25	285	12.9	23	276	11.4
4,000	30	276	17.5	31	264	12.5	22	272	17.2	24	273	18.9	24	288	15.4	22	271	15.5
5,000	30	278	20.2	30	271	15.3	18	270	21.4	21	271	20.9	21	291	19.1	19	270	18.4
6,000	30	275	24.3	30	266	20.7	13	275	24.2	15	272	19.7	18	284	22.1	15	265	17.8
8,000	30	274	30.0	22	281	20.3							11	290	19.8			
10,000	30	272	35.5	12	276	23.4												
12,000	28	273	41.4															
14,000	29	271	39.2															
16,000	29	271	28.6															
18,000	24	274	20.4															
20,000	13	277	14.7															

Altitude (meters) m.s.l.	Medford, Ore. (401 m.)			Miami, Fla. (12 m.)			Midland, Tex. (871 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma, City, Okla. (392 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	182	0.8	31	60	1.8	31	113	1.3	29	325	3.2	31	227	0.8	31	172	1.2	31	128	1.4
500	31	178	1.4	31	90	3.7	--	---	----	28	17	4.9	30	270	2.8	31	270	1.0	30	158	1.7
1,000	31	270	.8	31	113	2.4	31	156	2.0	28	276	5.6	28	251	6.8	30	238	2.0	29	233	4.7
1,500	30	202	6.5	31	186	.8	31	229	4.5	27	269	8.9	26	270	7.9	30	250	3.1	29	255	6.8
2,000	30	222	9.5	31	224	1.9	31	247	7.1	28	266	11.8	27	280	9.7	30	264	4.9	29	262	8.7
2,500	29	237	11.1	31	270	2.5	31	270	9.0	25	262	12.9	27	275	13.0	29	270	6.2	30	262	11.1
3,000	28	248	12.5	31	256	4.3	31	262	9.9	24	264	15.9	27	278	15.9	29	269	7.9	29	263	13.0
4,000	25	260	12.6	31	275	6.8	31	265	12.1	21	269	18.1	23	273	17.0	28	273	11.5	30	270	14.8
5,000	21	267	11.8	31	269	9.6	31	263	15.2	16	264	18.2	19	272	20.9	28	276	14.3	29	272	15.6
6,000	17	270	12.4	30	360	12.8	31	263	18.2	13	257	21.9	14	272	21.8	25	275	15.1	26	270	15.6
8,000	11	278	14.0	30	279	18.6	26	272	20.3							19	263	18.3	24	270	18.2
10,000	10	292	20.3	28	283	23.5	20	262	26.4							14	275	17.7	15	270	23.4
12,000				22	281	27.2	18	268	33.2										13	267	35.9
14,000				15	274	31.5	10	265	30.6												
16,000																					
18,000																					
20,000																					
22,000																					
24,000																					
26,000																					

Altitude (meters) m.s.l.	Rapid City, S. Dak. (980 m.)			St. Cloud, Minn. (318 m.)			San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)			Santa Maria, Calif. (72 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	339	1.2	31	317	0.9	31	55	1.6	31	98	2.6	31	291	0.4
500	--	---	----	31	309	1.5	31	117	3.9	31	85	7.3	29	348	1.7
1,000	30	270	.2	31	264	3.6	30	179	4.0	31	79	8.3	29	55	.2
1,500	30	270	5.5	29	288	6.2	30	210	5.2	31	77	8.2	29	263	1.3
2,000	30	279	9.2	29	287	8 8	30	236	6.2	31	74	8.3	29	281	3.4
2,500	31	279	12.3	27	360	10.8	31	247	7.1	31	90	7.3	29	270	5.4
3,000	30	282	14.3	27	284	13.4	31	260	8.6	31	66	6.5	29	272	8.7
4,000	26	282	16.4	27	283	17.9	29	261	10.9	31	54	4.3	30	263	9.0
5,000	24	281	19.9	27	280	21.1	29	259	15.0	31	17	3.3	29	267	11.2
6,000	22	278	23.8	27	282	25.6	29	262	18.7	30	352	3.0	29	272	12.0
8,000	11	270	26.3	17	274	28.6	20	266	19.2	30	291	7.5	25	294	12.2
10,000				10	261	31.7	17	263	28.2	30	280	17.2	22	279	16.8
12,000							11	284	26.3	30	272	22.3	19	276	18.4
14,000										28	276	18.6	18	276	19.8
16,000										27	287	9.0	18	274	15.8
18,000										24	297	6.8	15	300	8.3
20,000										23	304	3.4	13	358	3.9
22,000										21	28	.7			
24,000										16	87	2.9			
26,000										10	51	2.4			

Altitude (meters) m.s.l.	Sault Ste. Marie, Mich (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is., Wash. (33 m.)			Washington, D. C. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	89	1.7	31	178	2.5	27	135	2.3	31	285	1.5
500	31	138	1.3	--	---	----	26	205	2.7	31	276	6.3
1,000	31	263	3.5	31	270	2.9	26	270	3.2	31	270	8.6
1,500	31	277	7.4	30	228	9.5	26	247	4.7	31	284	10.4
2,000	31	287	9.8	28	235	9.7	25	252	5.9	31	286	11.9
2,500	31	270	11.1	26	252	9.0	25	257	9.1	31	282	13.3
3,000	31	277	13.0	24	260	9.9	25	250	10.8	31	275	13.8
4,000	31	276	16.8	20	273	13.1	24	249	13.3	31	275	20.3
5,000	31	275	21.6	15	280	13.8	22	248	16.2	30	277	23.5
6,000	31	276	25.8	11	360	12.8	18	270	18.8	30	270	28.3
8,000	30	270	33.9				12	268	21.2	29	270	36.8
10,000	28	276	37.0							28	276	46.0
12,000	20	281	32.8							28	276	47.3
14,000	14	282	30.9							24	273	42.5
16,000										21	271	31.0
18,000										18	273	18.4
20,000										15	260	15.3
22,000										11	259	11.5

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.: directions in degrees from north (N = 360°,E = 90°,S = 180°,W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following Table 22 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun. JANUARY 1954

ALBUQUERQUE, N. MEX.

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
	Air mass								
	4.08	3.26	2.44	1.63	*0.815	1.63	2.44	3.26	4.08
Jan.									
1	1.11	1.21	1.31	1.41	----	1.45	1.28	1.19	1.05
2	1.05	1.16	1.28	1.43	----	1.25	1.18	1.05	.95
3	1.02	1.13	1.26	1.42	----	1.45	----	----	----
4	.97	1.10	1.24	----	----	1.39	----	----	----
5	1.05	1.14	1.25	1.42	----	1.44	1.28	1.17	1.06
6	1.11	1.15	1.26	----	----	----	----	----	----
7	----	----	----	----	----	----	----	1.08	.97
10	1.05	1.16	1.30	1.46	----	1.43	1.30	1.18	1.08
11	1.03	1.15	1.30	1.39	----	----	----	----	----
13	----	----	----	----	----	----	.99	.84	----
14	----	----	----	----	----	1.31	1.07	.96	.88
15	----	----	----	----	----	----	1.23	1.12	1.01
16	----	----	1.27	1.42	----	1.43	1.28	1.15	1.06
21	----	----	----	----	----	----	1.25	1.14	1.06
22	----	1.15	1.28	1.42	----	----	----	----	----
23	1.06	1.16	1.26	1.41	----	----	----	----	----
26	1.02	1.12	1.22	----	----	----	----	----	----
27	----	----	1.22	1.39	----	----	1.22	1.08	.88
29	1.03	1.14	1.24	----	----	----	----	----	----
31	.99	1.07	1.19	1.34	----	1.34	1.18	1.05	.93
Averages	1.04	1.14	1.26	1.41	----	1.39	1.21	1.08	.99
Departures	+.02	+.03	+.02	+.03	----	-.02	-.04	-.06	-.05

LINCOLN, NEBR.

Date	Air mass								
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77
Jan.									
2	0.83	0.92	1.09	----	----	----	1.09	1.01	0.92
5	.77	.90	1.05	----	----	----	----	----	----
6	.83	.94	1.09	----	----	----	1.11	1.01	.88
11	----	----	1.11	----	----	----	1.13	1.02	.92
23	.72	.85	1.00	----	----	----	----	----	----
Averages	.79	.90	1.07	----	----	----	1.11	1.01	.91
Departures	-.11	-.14	-.13	----	----	----	-.07	-.04	-.02

MADISON, WIS.

Date	Air mass								
	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81

NO DATA DURING JANUARY 1954

BLUE HILL, MASS.

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
	Air mass								
	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86
Jan.									
8	0.97	1.09	1.23	----	----	----	1.26	1.12	1.01
13	----	----	----	----	----	----	1.23	1.14	1.05
14	1.03	1.12	1.23	----	----	----	----	----	----
15	----	----	.95	----	----	----	1.00	.82	----
17	----	----	----	----	----	----	1.23	1.12	1.00
29	1.05	1.12	1.25	----	----	----	1.23	1.10	.99
31	.86	.95	1.07	----	----	----	----	----	----
Averages	.98	1.07	1.15	----	----	----	1.19	1.06	1.01
Departures	+.04	+.03	-.01	----	----	----	+.01	+.02	+.07

TABLE MOUNTAIN, CALIF.

Date	Air mass								
	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76
Jan.									
4	----	----	----	1.42	----	----	----	----	----
5	----	----	----	1.45	----	----	----	----	----
9	----	----	----	1.52	----	----	----	----	----
14	----	----	----	1.44	----	----	----	----	----
31	----	----	----	1.47	----	----	----	----	----
Averages	----	----	----	1.46	----	----	----	----	----
Departures	----	----	----	-.08	----	----	----	----	----

BOSTON, MASS.

Date	Air mass								
	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96

NO DATA DURING JANUARY 1954

* Extrapolated

Langley is the unit used to denote one gram calorie per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

SOLAR RADIATION DATA

JANUARY 1954

Table 31a Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date------------	1	2	3	4	5	6	7		8	9	10	11	12	13	14		15	16	17	18	19	20	21	
Langleys--------	53	84	71	67	54	20	43	56	46	19	50	36	72	83	73	54	77	42	78	86	48	39	34	58
Date------------	22	23	24	25	26	27	28		29	30	31	1	2	3	4									
Langleys--------	39	69	67	48	44	11	79	51	86	40	90	75	52	46	49	63								

Table 31b Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date------------	1	2	3	4	5	6	7		8	9	10	11	12	13	14		15	16	17	18	19	20	21	
Langleys--------	39	130	116	66	68	18	159	85	183	21	53	30	73	215	229	115	169	34	179	180	55	36	50	100
Date------------	22	23	24	25	26	27	28		29	30	31	1	2	3	4									
Langleys--------	48	76	63	75	71	10	79	60	260	44	234	238	53	50	45	132								

Table 31c Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date------------	1	2	3	4	5	6	7		8	9	10	11	12	13	14		15	16	17	18	19	20	21	
Langleys--------	39	311	254	267	93	22	328	188	544	16	59	29	110	590	520	267	500	37	543	391	50	31	112	238
Date------------	22	23	24	25	26	27	28		29	30	31	1	2	3	4									
Langleys--------	43	102	83	156	243	10	93	104	---	---	---	477	100	48	45	167								

Table 31d Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date------------	1	2	3	4	5	6	7		8	9	10	11	12	13	14		15	16	17	18	19	20	21	
Langleys--------	45	149	69	153	53	22	67	80	179	17	41	27	75	211	147	100	178	42	224	144	45	34	35	100
Date------------	22	23	24	25	26	27	28		29	30	31	1	2	3	4									
Langleys--------	40	81	94	58	90	8	75	64	237	30	227	128	95	48	49	117								

Table 31e Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date------------	1	2	3	4	5	6	7		8	9	10	11	12	13	14		15	16	17	18	19	20	21	
Langleys--------	49	80	79	66	90	28	55	64	44	19	55	34	98	47	58	51	53	39	51	88	70	38	67	58
Date------------	22	23	24	25	26	27	28		29	30	31	1	2	3	4									
Langleys--------	77	105	---	100	76	12	105	80	58	47	81	71	84	68	79	70								

Note: Langley is the unit used to denote one gram calorie per square centimeter.

SOLAR RADIATION DATA

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.

1954	Aklavik,Mackenzie	Albuquerque, N.Mex.	Apalachicola, Fla.	Astoria, Oreg.	Atlanta, Ga.	Barrow, Alaska	Bethel, Alaska	Hismark, N. Dak.	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Tex.	Canton Island, Pacific Area	Caribou, Me.	Charleston, S. C.	Columbia, Mo.	Columbus, Ohio	Davis, Calif.	Dodge City, Kans.	E. Lansing, Mich.	E. Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Ely, Nev.	Fairbanks, Alaska	Fort Worth, Tex.	Fresno, Calif.	Grand Junction,Colo.	Greensboro, N. C.	Griffin, Ga.	Hatteras, N. C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.
Jan. 1------	---	348	390	93	336	---	38	50	50	124	---	330	637	170	340	286	261	211	277	143	70	67	382	242	3	385	290	278	298	311	309	216	385	23
Jan. 2------	---	330	182	27	306	---	56	166	149	98	---	263	545	151	285	275	252	153	273	130	184	60	375	259	7	393	264	268	288	257	304	203	337	149
Jan. 3------	---	319	281	57	332	---	37	127	127	160	---	80	671	42	248	298	39	143	263	55	153	74	378	211	11	392	274	229	292	---	291	69	253	1
Jan. 4------	---	333	193	16	295	---	34	106	142	24	---	269	655	55	306	134	58	204	273	31	129	44	376	246	11	309	277	205	300	338	308	183	331	14
Jan. 5------	1	342	217	24	290	---	38	176	98	98	---	375	(536)	94	260	217	58	237	220	33	110	28	363	263	8	388	277	261	208	322	235	94	336	59
Jan. 6------	1	307	380	23	309	---	34	164	27	74	---	396	582	34	268	245	149	60	278	69	79	50	368	127	8	389	247	225	230	257	234	91	312	65
Jan. 7------	1	243	389	38	336	---	---	116	144	108	---	399	594	68	322	265	139	163	228	27	190	51	330	260	4	385	(164)	219	284	284	314	223	322	146
Averages------	---	317	290	40	315	---	39	129	105	98	---	302	(603)	88	290	246	137	167	259	70	131	53	368	230	8	377	(256)	241	272	295	285	154	325	65
Departures----	---	---	---	---	---	---	---	---	-21	---	---	---	---	---	---	---	---	+6	---	-9	+14	---	---	---	+1	---	+95	---	---	---	---	---	---	-33
Jan. 8------	0	336	381	73	---	---	41	101	218	170	---	368	588	162	312	160	204	252	183	61	230	85	207	298	4	357	277	278	272	267	317	174	333	104
Jan. 9------	1	146	272	101	268	---	39	185	19	188	---	174	585	125	289	293	67	226	124	9	49	113	308	317	7	53	312	284	184	250	272	135	368	1
Jan. 10------	2	360	190	113	106	---	25	106	57	122	---	232	615	181	---	197	69	181	248	169	81	94	379	183	9	83	(318)	288	142	167	117	152	354	56
Jan. 11------	1	362	207	191	162	---	41	142	34	125	---	423	(642)	166	64	281	236	---	296	75	55	112	353	116	7	---	229	218	38	195	61	184	188	99
Jan. 12------	4	109	359	166	339	---	25	50	103	143	---	62	654	49	319	332	152	258	135	173	118	43	244	228	16	110	(232)	75	322	311	324	262	206	99
Jan. 13------	2	343	141	56	---	---	39	105	231	72	---	130	676	177	257	120	186	258	306	152	267	57	370	287	20	(52)	(294)	165	284	257	327	106	362	194
Jan. 14------	4	265	(137)	115	82	---	23	167	216	26	---	324	600	195	162	49	53	210	---	37	252	95	118	202	17	93	(326)	280	55	61	213	18	354	85
Averages------	2	274	(241)	117	191	---	33	122	125	121	---	245	(623)	151	234	205	138	231	215	96	150	86	283	233	11	(125)	(284)	227	185	216	233	147	309	91
Departures----	---	---	---	---	---	---	---	---	-26	---	---	---	---	---	---	---	---	+50	---	+2	+6	---	---	---	+1	---	+115	---	---	---	---	---	---	-23
Jan. 15------	1	368	---	81	96	---	30	171	215	40	---	293	570	138	280	41	59	72	308	130	168	140	401	267	---	144	(299)	265	78	164	81	13	213	191
Jan. 16------	(2)	368	---	72	316	---	44	126	39	14	---	421	654	65	233	251	49	42	---	31	66	118	410	254	---	69	(334)	164	215	303	88	24	359	48
Jan. 17------	1	263	---	136	361	---	27	142	231	71	---	406	617	123	341	321	223	263	(218)	198	237	46	372	262	(17)	93	(145)	149	312	357	(326)	220	315	191
Jan. 18------	4	321	---	137	360	---	47	224	199	59	---	203	---	199	288	36	219	214	243	51	228	124	401	161	4	86	(60)	262	187	312	360	127	193	185
Jan. 19------	3	167	---	220	---	---	(51)	153	70	114	---	217	652	190	162	83	53	147	117	36	110	141	206	124	14	96	(84)	52	107	221	270	27	159	77
Jan. 20------	5	165	---	75	---	---	51	235	38	238	---	368	631	40	201	22	74	275	133	18	66	74	340	211	25	(261)	342	106	91	97	142	83	341	41
Jan. 21------	5	369	---	29	113	---	57	189	82	69	---	64	624	90	249	74	108	155	161	180	106	111	410	233	34	141	314	173	95	54	213	130	365	89
Averages------	(3)	289	---	107	249	---	(44)	177	125	87	---	282	625	121	251	118	112	167	(197)	92	140	108	363	216	(19)	(127)	(225)	167	155	215	(212)	89	278	118
Departures----	---	---	---	---	---	---	---	---	-31	---	---	---	---	---	---	---	---	-31	---	-16	-5	---	---	---	+5	---	+27	---	---	---	---	---	---	+3
Jan. 22------	8	389	---	47	68	---	76	161	77	51	84	411	661	208	119	333	206	33	293	149	81	91	389	285	15	449	(258)	322	28	54	36	255	333	150
Jan. 23------	8	385	---	92	---	---	61	157	105	125	95	383	654	234	330	334	239	41	325	184	98	148	423	309	11	---	186	192	350	120	89	210	375	258
Jan. 24------	4	322	---	162	65	---	71	173	99	123	66	150	---	216	198	51	86	26	232	7	162	101	386	126	18	404	(51)	228	161	92	234	27	315	252
Jan. 25------	8	198	---	23	---	(2)	56	138	126	239	110	176	638	93	123	52	71	300	215	15	178	124	388	216	36	130	352	110	289	276	208	35	409	16
Jan. 26------	14	398	---	86	149	2	64	176	149	61	139	---	633	32	(278)	(29)	55	192	305	6	144	112	424	318	32	113	332	263	323	203	309	14	333	45
Jan. 27------	10	392	---	57	241	1	91	239	12	34	6	---	593	92	314	376	43	73	328	98	53	126	369	292	40	(299)	(309)	330	218	202	283	35	386	21
Jan. 28------	13	364	---	---	403	1	72	227	105	178	111	319	639	111	(391)	181	334	111	243	208	152	96	416	206	39	303	(145)	320	359	400	398	123	228	124
Averages------	9	350	---	78	185	(2)	70	182	96	116	87	288	636	141	(250)	(194)	147	111	277	95	124	114	399	250	27	(283)	(233)	252	247	192	222	100	340	124
Departures----	---	---	---	---	---	---	---	---	-67	---	-33	---	---	---	---	---	---	-101	---	-14	-11	---	---	---	+2	---	+21	---	---	---	---	---	---	-3
Jan. 29------	10	378	---	67	206	6	80	231	282	89	262	372	670	253	245	(308)	182	105	234	63	283	124	387	189	34	130	312	219	113	270	275	286	274	273
Jan. 30------	10	284	---	112	---	(4)	81	208	47	259	42	412	533	91	232	377	328	290	339	198	102	112	385	353	20	78	273	331	225	140	344	302	418	177
Jan. 31------	13	403	---	213	---	6	105	184	257	183	264	223	640	220	280	370	286	142	352	250	265	157	173	---	38	415	262	356	309	368	341	182	422	191
Feb. 1------	15	410	---	218	426	7	99	148	257	102	224	295	665	282	392	191	132	155	342	136	277	114	231	---	43	(403)	136	363	363	411	404	202	430	96
Feb. 2------	12	426	---	190	329	11	132	153	90	243	66	265	693	110	349	355	255	61	366	215	141	64	386	---	24	(482)	119	355	329	368	290	170	439	166
Feb. 3------	24	428	---	229	---	12	40	216	70	247	41	354	593	86	270	356	314	126	361	225	125	97	446	377	40	(471)	(107)	370	97	236	297	286	453	145
Feb. 4------	19	424	---	120	427	15	55	189	79	257	86	424	610	75	378	383	150	43	368	178	107	---	442	391	41	476	237	372	115	431	328	86	450	108
Averages------	15	393	---	164	347	(9)	84	190	155	197	141	335	629	160	307	(334)	235	132	337	181	186	112	350	328	34	(351)	(207)	338	221	318	325	218	412	165
Departures----	---	---	---	---	---	---	---	---	-51	---	-27	---	---	---	---	---	---	-67	---	+31	-4	---	---	---	-8	---	-6	---	---	---	---	---	---	-14
Accumulated Departures January 1 to February 4, 1954	---	---	---	---	---	---	---	---	-1372	---	---	---	---	---	---	---	---	-1001	---	-42	0	---	---	---	+7	---	+1764	---	---	---	---	---	---	-490

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

SOLAR RADIATION DATA

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.-Continued JANUARY 1954

	Lake Charles, La.	Las. Vegas, Nev.	Lincoln, Nebr.	Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBCO)	Madison, Wis.	Medford, Ore.	Miami, Fla.	Midland, Tex.	Nashville, Tenn.	Newport, R. I.	New York, N. Y.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Ottawa, Ontario
1954																
Jan. 1------	---	294	188	327	289	260	141	107	314	352	283	76	131	271	320	(78)
Jan. 2------	247	303	217	191	303	(260)	111	76	328	353	246	193	170	259	310	82
Jan. 3------	344	248	198	326	270	(263)	117	(100)	257	358	286	141	76	279	316	89
Jan. 4------	48	305	204	213	306	284	139	68	274	352	248	187	219	231	303	90
Jan. 5------	365	309	219	320	333	291	137	105	350	349	198	---	114	183	228	102
Jan. 6------	350	232	226	316	291	256	84	152	336	356	89	64	28	148	306	78
Jan. 7------	349	301	184	300	287	263	198	87	410	305	290	233	238	264	312	205
Averages------	284	285	205	285	297	(268)	132	(99)	324	346	234	149	139	234	299	(103)
Departures----	---	---	+34	---	---	---	+5	---	---	---	+113	+22	+24	---	---	---
Jan. 8------	289	232	197	273	258	188	141	84	280	310	206	250	242	166	286	(220)
Jan. 9------	155	331	155	71	327	297	191	81	235	293	39	24	66	97	92	(47)
Jan. 10------	111	315	226	59	338	298	230	112	222	348	35	84	61	4	162	(217)
Jan. 11------	384	118	234	347	193	150	199	64	157	375	284	41	33	199	334	(208)
Jan. 12------	196	209	182	223	68	69	230	216	411	152	298	123	183	307	135	(177)
Jan. 13------	148	320	110	141	353	305	106	103	324	89	195	259	262	164	---	(230)
Jan. 14------	146	318	83	64	---	293	106	48	375	113	34	218	86	4	162	(130)
Averages------	204	263	170	168	256	229	172	101	286	240	156	143	133	134	195	(176)
Departures----	---	---	-7	---	---	---	+35	---	---	---	+19	-9	---	---	---	---
Jan. 15------	91	158	112	56	286	256	(46)	22	375	376	31	232	174	---	161	(205)
Jan. 16------	161	347	132	111	315	272	179	30	362	377	34	56	60	164	334	(161)
Jan. 17------	116	316	233	82	205	186	238	155	381	201	299	250	260	79	321	252
Jan. 18------	252	275	182	110	84	(88)	101	46	307	386	273	257	187	274	144	(129)
Jan. 19------	218	150	113	62	86	58	(35)	168	321	206	180	101	84	144	176	(157)
Jan. 20------	119	209	182	65	369	248	37	243	410	316	23	50	33	21	201	(27)
Jan. 21------	61	309	220	43	298	283	261	60	290	336	---	111	116	32	258	(257)
Averages------	145	252	168	76	235	(199)	(128)	104	349	314	140	151	131	102	228	(170)
Departures----	---	---	-31	---	---	---	-24	---	---	---	-11	-6	---	---	---	---
Jan. 22------	217	349	234	291	364	324	241	75	368	367	54	63	48	29	278	(249)
Jan. 23------	113	339	261	72	149	161	170	126	387	471	71	202	248	64	346	(273)
Jan. 24------	191	163	194	83	69	42	39	168	438	343	98	109	51	228	366	246
Jan. 25------	228	339	88	83	309	108	40	257	358	411	90	167	93	122	290	(94)
Jan. 26------	153	325	103	46	288	262	56	111	275	425	91	182	211	105	171	26
Jan. 27------	135	349	286	284	409	367	268	18	301	366	237	28	45	322	353	89
Jan. 28------	385	267	183	225	313	254	119	87	368	304	232	143	281	293	134	(307)
Averages------	203	305	193	155	272	217	133	120	356	384	125	128	140	166	277	(184)
Departures----	---	---	-25	---	---	---	-44	---	---	---	-36	-27	---	---	---	---
Jan. 29------	199	276	187	234	205	189	210	196	446	297	300	313	245	183	121	(370)
Jan. 30------	149	378	147	315	233	(318)	(293)	267	425	75	192	81	75	183	327	233
Jan. 31------	343	378	268	368	408	(378)	241	175	421	387	374	281	261	355	370	365
Feb. 1------	387	386	204	342	415	(359)	281	260	349	283	363	296	234	331	302	(258)
Feb. 2------	(370)	403	275	388	400	369	237	266	403	373	367	154	220	326	384	69
Feb. 3------	425	408	242	374	438	387	231	270	439	440	83	78	39	51	367	(182)
Feb. 4------	---	413	296	376	426	377	93	273	460	444	353	129	156	75	380	(131)
Averages------	(312)	378	231	342	361	(340)	227	244	421	329	290	190	176	215	322	(230)
Departures----	---	---	+13	---	---	---	+37	---	---	---	+105	-15	---	---	---	---
Accumulated Departures January 1 to February 4, 1954	---	---	-112	---	---	---	+63	---	---	---	+1330	-245	---	---	---	---

	Phoenix, Ariz.	Prosser 4 NE, Wash.	Rapid City, S. Dak.	Riverside, Calif.	San Antonio, Tex.	Santa Maria, Calif.	S. Ste. Marie, Mich.	Sayville, N. Y.	Seabrook, N. J.	Seattle, Wash.	Schenectady, N. Y.	State College, Pa.	Swan Is., W. I.	Tampa, Fla.	Upton, N. Y.	Wake Island, Pacific Area	Washington, D. C. (Silver Hill Obs.)	Winnipeg, Manitoba
1954																		
Jan. 1------	355	122	168	294	449	269	122	100	224	88	87	28	(419)	403	104	229	243	73
Jan. 2------	343	100	195	310	425	305	19	212	236	51	129	175	---	295	213	227	237	139
Jan. 3------	311	143	113	263	449	304	184	91	91	53	30	7	---	371	123	211	61	50
Jan. 4------	344	62	148	306	381	318	84	206	217	29	70	45	---	246	213	204	228	127
Jan. 5------	334	71	187	327	459	322	41	95	112	20	49	20	391	238	121	214	124	107
Jan. 6------	229	95	203	292	453	201	176	29	60	39	85	161	455	443	51	231	161	83
Jan. 7------	183	57	129	309	446	329	121	228	165	24	161	141	(381)	443	221	203	229	72
Averages------	300	93	163	300	437	293	107	137	158	43	87	82	(411)	349	149	217	183	93
Departures----	---	---	---	+50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Jan. 8------	297	185	133	156	350	330	92	242	232	69	198	195	476	412	236	229	243	38
Jan. 9------	326	80	212	366	120	349	131	39	142	36	18	61	457	333	49	136	131	147
Jan. 10------	363	72	217	354	461	334	---	43	33	148	90	41	426	316	68	108	20	94
Jan. 11------	253	129	151	304	464	220	167	22	49	153	85	127	471	176	(32)	196	67	181
Jan. 12------	235	177	79	80	215	97	(186)	179	211	129	130	190	261	430	(190)	185	257	140
Jan. 13------	211	136	164	327	131	346	144	279	246	8	214	235	445	350	---	187	196	82
Jan. 14------	354	154	154	278	110	350	102	147	134	38	179	54	467	405	---	238	102	167
Averages------	305	133	159	266	264	289	(137)	136	150	83	131	128	429	346	(115)	183	145	121
Departures----	---	---	---	+19	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Jan. 15------	364	157	180	240	352	217	148	193	151	69	136	80	320	410	---	173	106	---
Jan. 16------	375	132	102	343	462	(218)	113	60	45	46	46	78	488	296	65	225	231	---
Jan. 17------	275	163	118	256	146	87	204	257	264	85	228	222	478	402	247	240	274	---
Jan. 18------	298	137	181	138	244	75	64	239	275	104	171	223	446	260	235	239	297	---
Jan. 19------	145	231	131	90	166	62	80	133	205	183	66	47	477	324	149	246	---	---
Jan. 20------	130	256	249	251	420	332	56	89	171	125	37	75	479	259	96	229	63	---
Jan. 21------	378	96	235	341	348	243	187	103	101	26	162	118	454	315	124	232	75	---
Averages------	281	167	171	237	305	(177)	122	153	173	91	121	120	449	324	153	226	174	---
Departures----	---	---	---	-36	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Jan. 22------	388	141	202	331	468	348	202	36	44	35	124	111	500	284	51	218	36	---
Jan. 23------	370	207	216	289	490	81	194	189	206	98	222	263	498	345	174	216	164	---
Jan. 24------	383	234	161	65	288	(26)	29	49	118	100	182	238	506	316	70	188	146	---
Jan. 25------	60	139	152	165	157	377	110	75	92	32	52	46	---	334	108	239	253	---
Jan. 26------	345	205	257	287	178	288	143	234	235	121	66	149	271	378	237	263	291	---
Jan. 27------	398	88	259	321	106	322	155	30	154	45	45	145	522	370	43	201	273	161
Jan. 28------	375	150	243	263	169	257	248	192	253	98	147	286	479	427	198	256	336	139
Averages------	331	166	213	246	265	(243)	154	115	158	75	120	176	463	351	126	226	214	---
Departures----	---	---	---	-15	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Jan. 29------	292	151	61	202	238	194	74	307	284	115	236	171	(445)	411	301	236	271	(209)
Jan. 30------	342	217	193	402	331	400	232	63	150	56	82	197	493	409	88	263	192	(221)
Jan. 31------	399	216	227	397	407	406	277	271	243	150	227	164	521	229	256	243	277	(124)
Feb. 1------	404	117	259	409	362	409	58	271	272	164	198	128	502	406	268	233	262	(218)
Feb. 2------	404	127	267	406	212	440	167	208	215	103	189	170	518	307	212	240	301	---
Feb. 3------	442	76	219	431	532	422	247	27	94	203	26	166	527	464	60	219	135	---
Feb. 4------	428	104	281	433	515	430	136	237	220	110	100	157	519	405	238	248	237	---
Averages------	387	144	216	383	371	386	170	198	211	129	151	165	(504)	376	203	240	239	(193)
Departures----	---	---	---	+13	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Accumulated Departures January 1 to February 4, 1954	---	---	---	+217	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

ILLUMINATION DATA

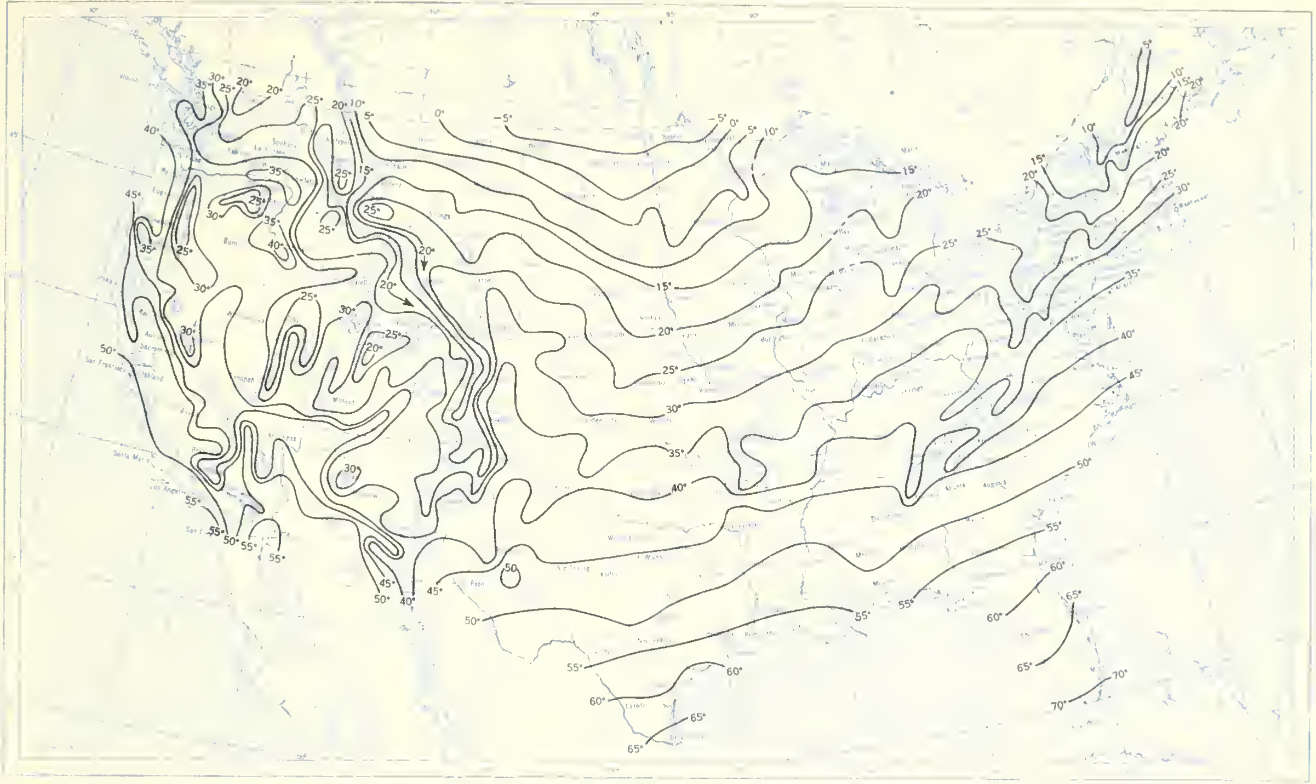
Table 34.-Daily illumination on a horizontal surface, tabulated in hundreds of foot-candle hours. JANUARY 1954

Station	Day of month																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average
Baltimore, Md.	249	243	74	---	120	190	210	266	164	39	30	206	192	102	99	194	286	---	246	72	76	52	183	154	196	(279	244	312	274	198	268	180
Washington, D.C. (WBCO)	---	---	76	---	110	179	226	244	140	28	79	239	190	86	82	203	218	254	214	58	76	45	173	148	220	281	281	313	---	---	---	167

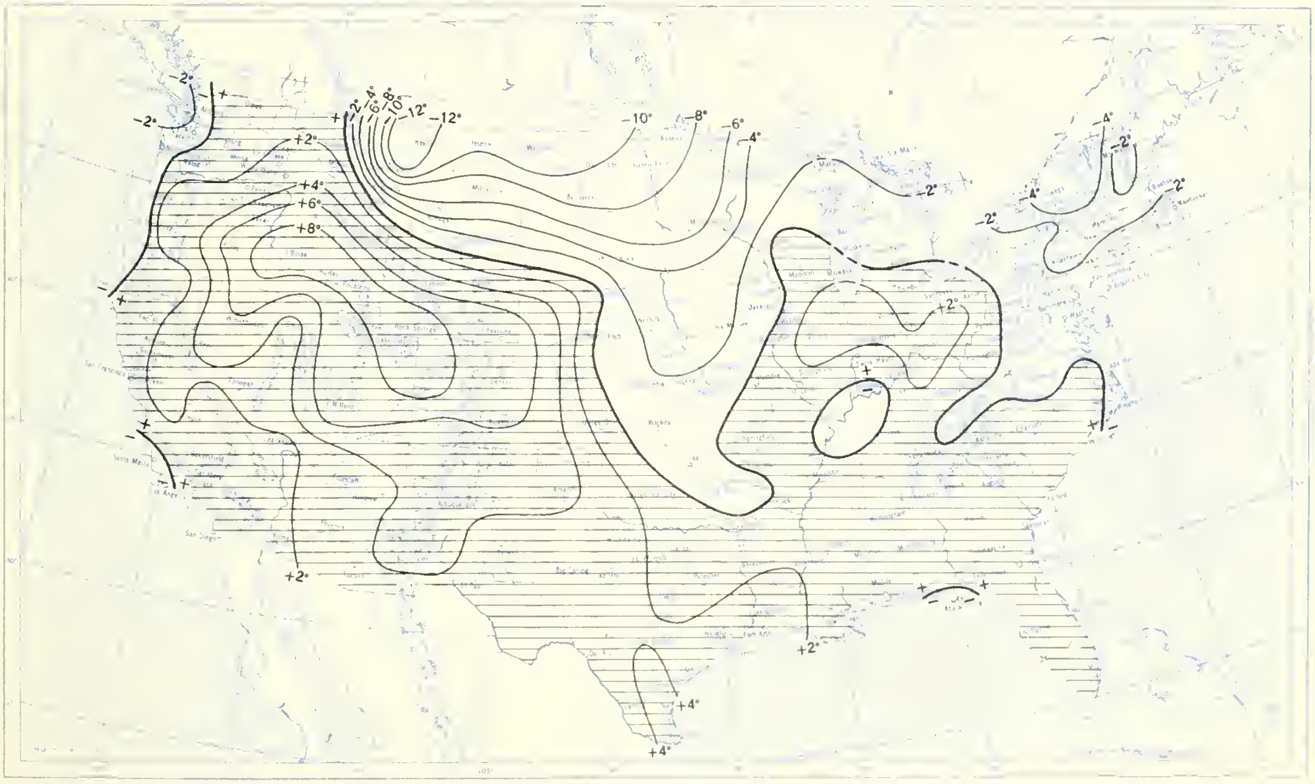
The foot-candle hour is the average illumination for one hour, in foot candles. Foot-candle hours for a day are obtained by summing the foot-candle hours for the individual hours of that day. The illumination values are compiled from continuous records of the illumination output of a Foster Illuminometer. For a description of this instrument see "A Recording Daylight Illuminometer", by Norman B. Foster, in Illuminating Engineering, Vol. XLVI No. 2, pages 59 to 62.

NWRC, Asheville, N.C. --- 4/15/54 --- 2000

Chart I. A. Average Temperature (°F.) at Surface, January 1954.

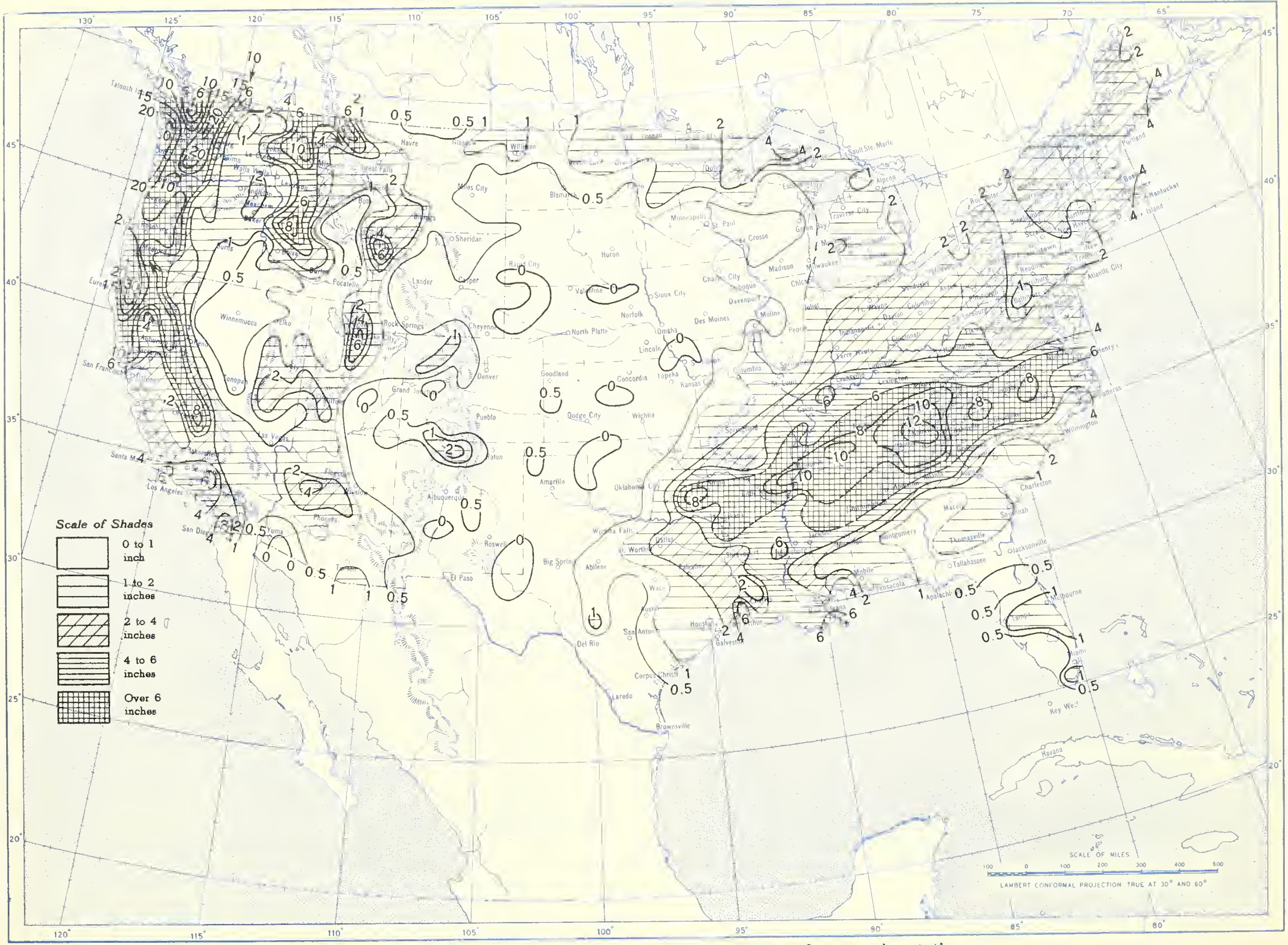


B. Departure of Average Temperature from Normal (°F.), January 1954.



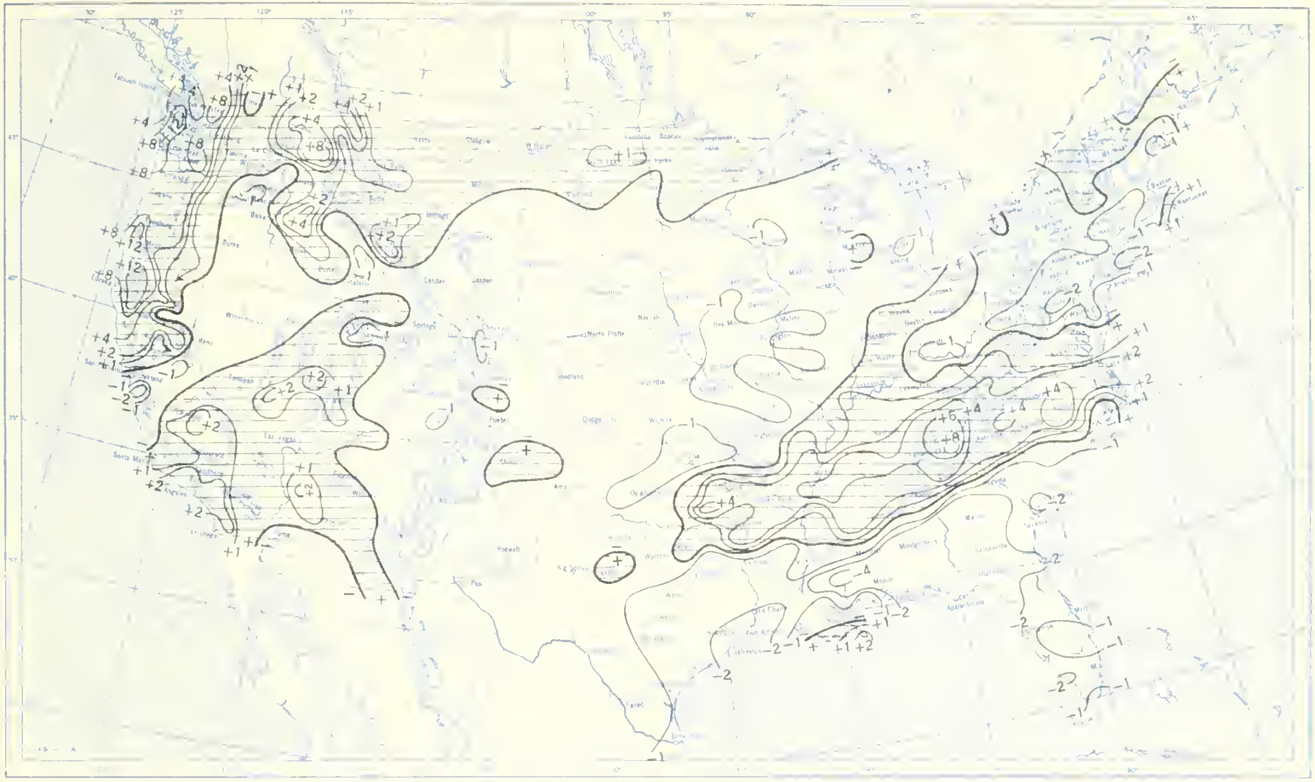
A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.
B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), January 1954.

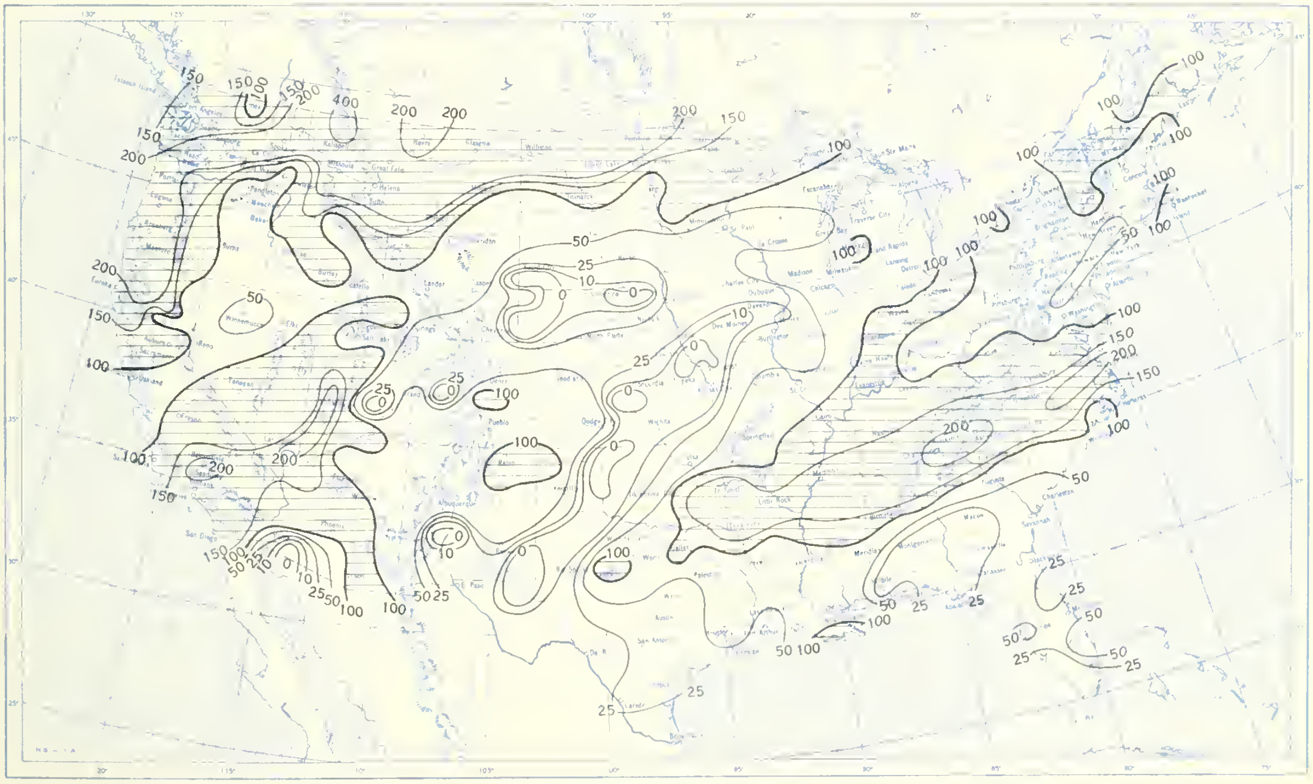


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), January 1954.

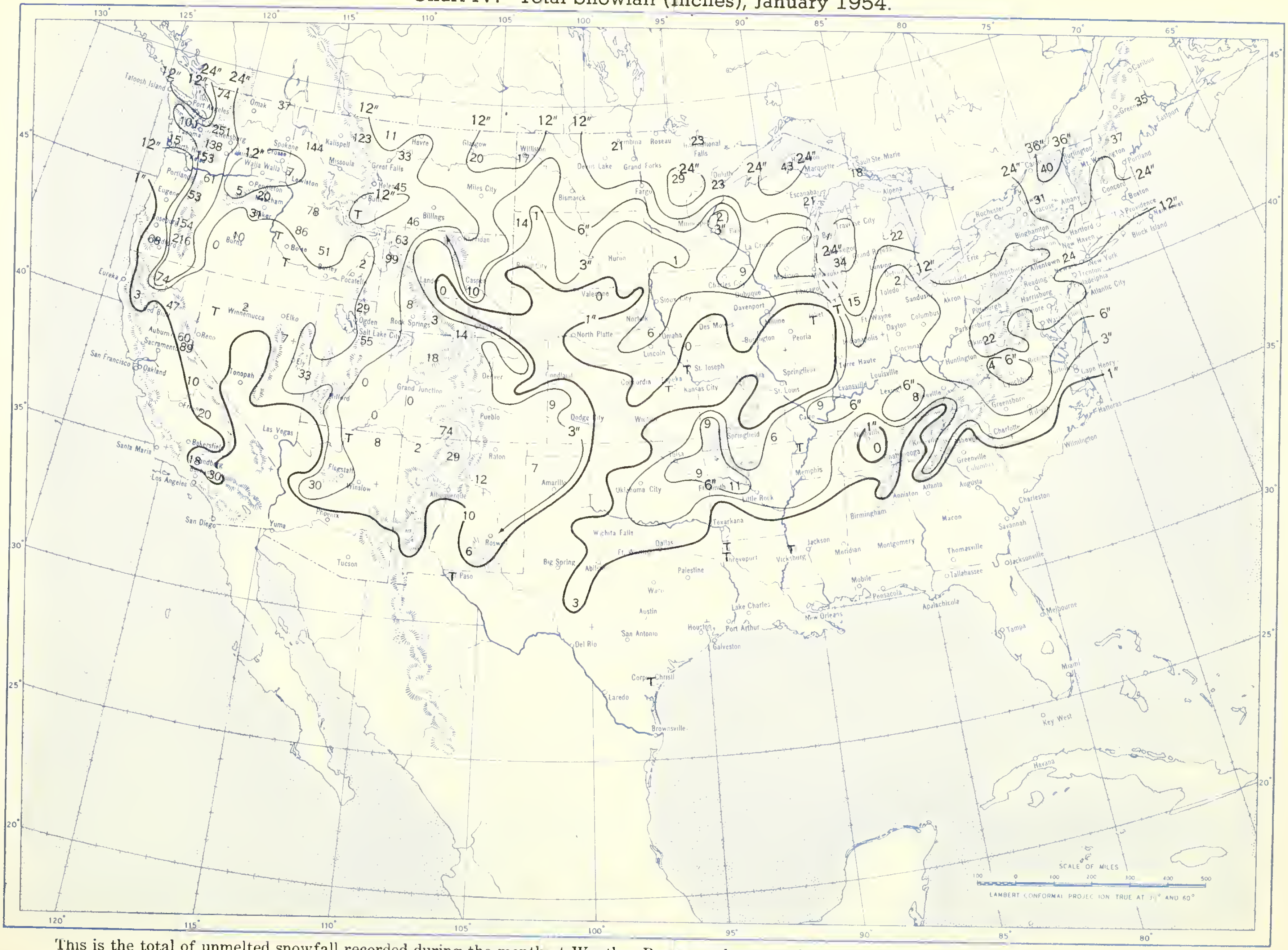


B. Percentage of Normal Precipitation, January 1954.



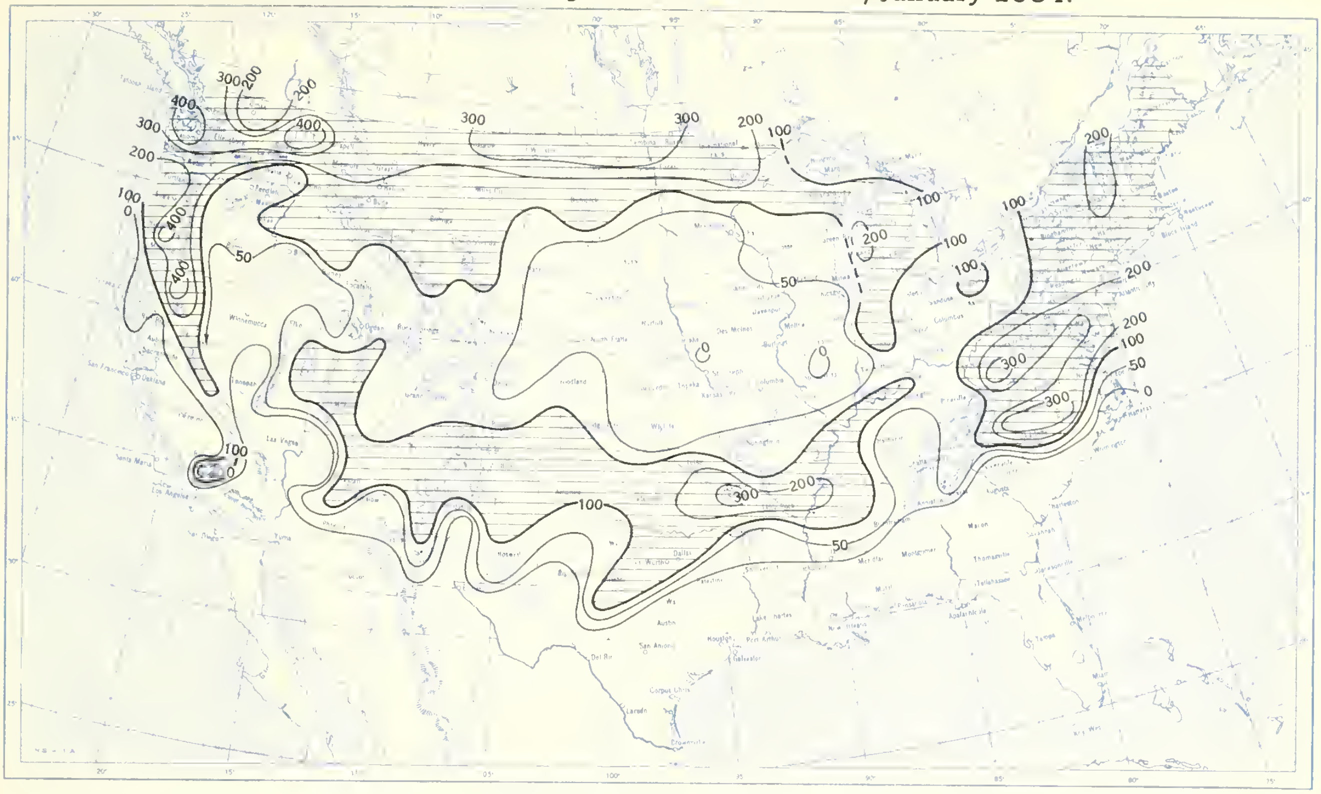
Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart IV. Total Snowfall (Inches), January 1954.

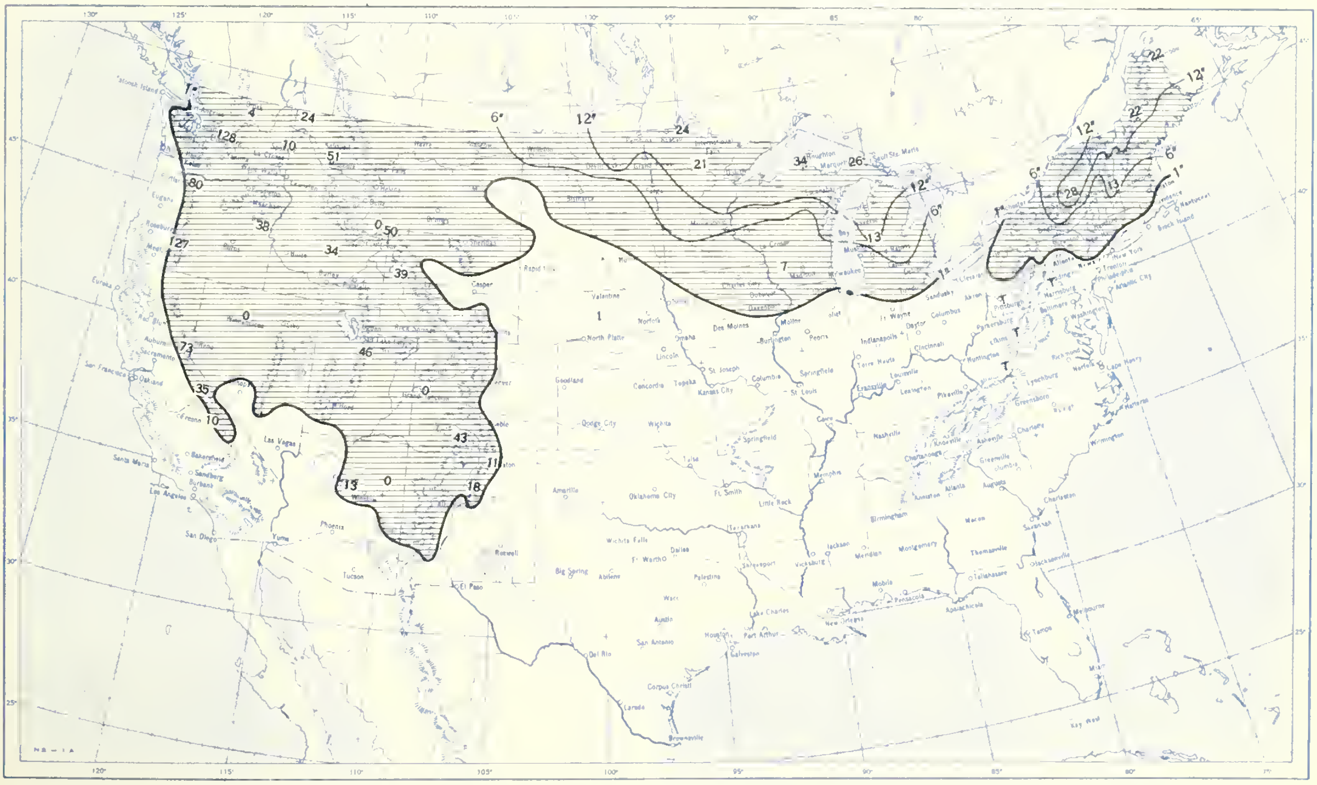


This is the total of unmelted snowfall recorded during the month at Weather Bureau and cooperative stations. This chart and Chart V are published only for the months of November through April although of course there is some snow at higher elevations, particularly in the far West, earlier and later in the year.

Chart V. A. Percentage of Normal Snowfall, January 1954.

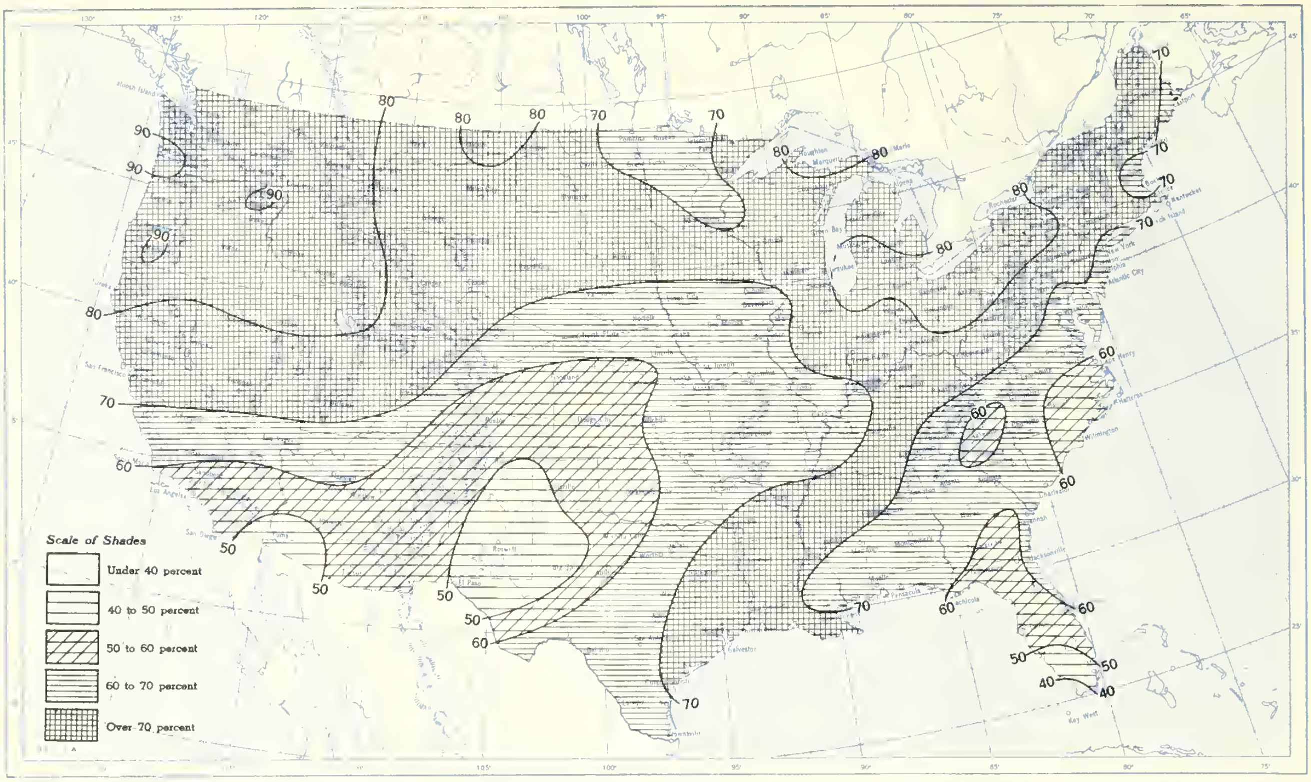


B. Depth of Snow on Ground (Inches), 7:30 a. m. E. S. T., January 26, 1954.

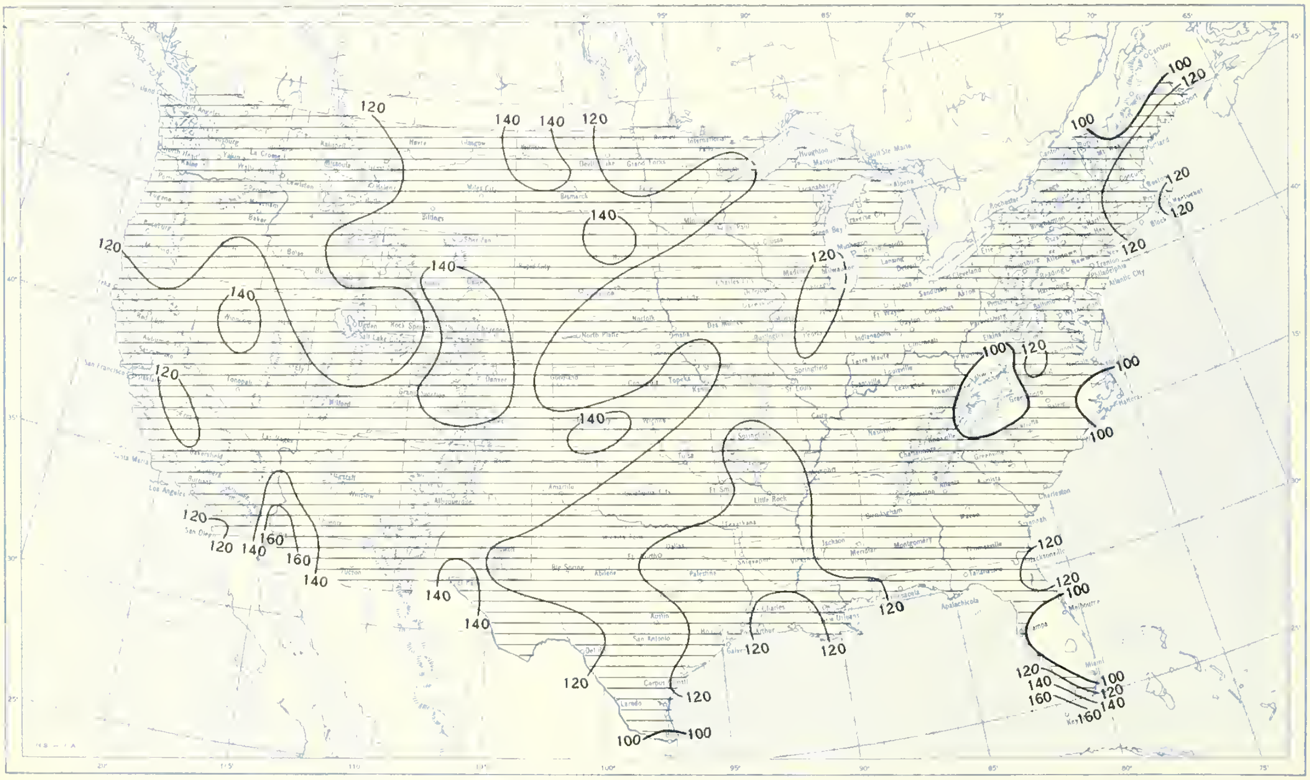


A. Amount of normal monthly snowfall is computed for Weather Bureau stations having at least 10 years of record.
B. Shows depth currently on ground at 7:30 a.m. E.S.T., of the Tuesday nearest the end of the month. It is based on reports from Weather Bureau and cooperative stations. Dashed line shows greatest southern extent of snowcover during month.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, January 1954.

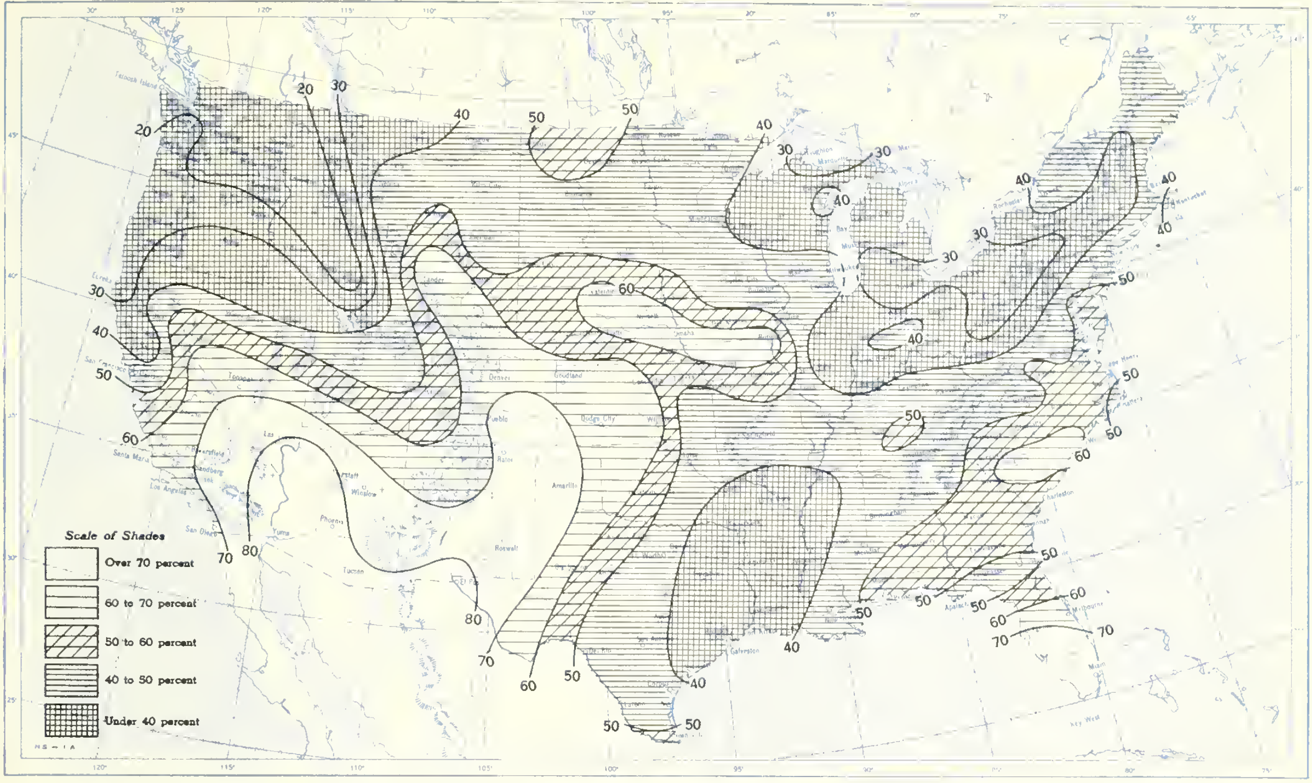


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, January 1954.

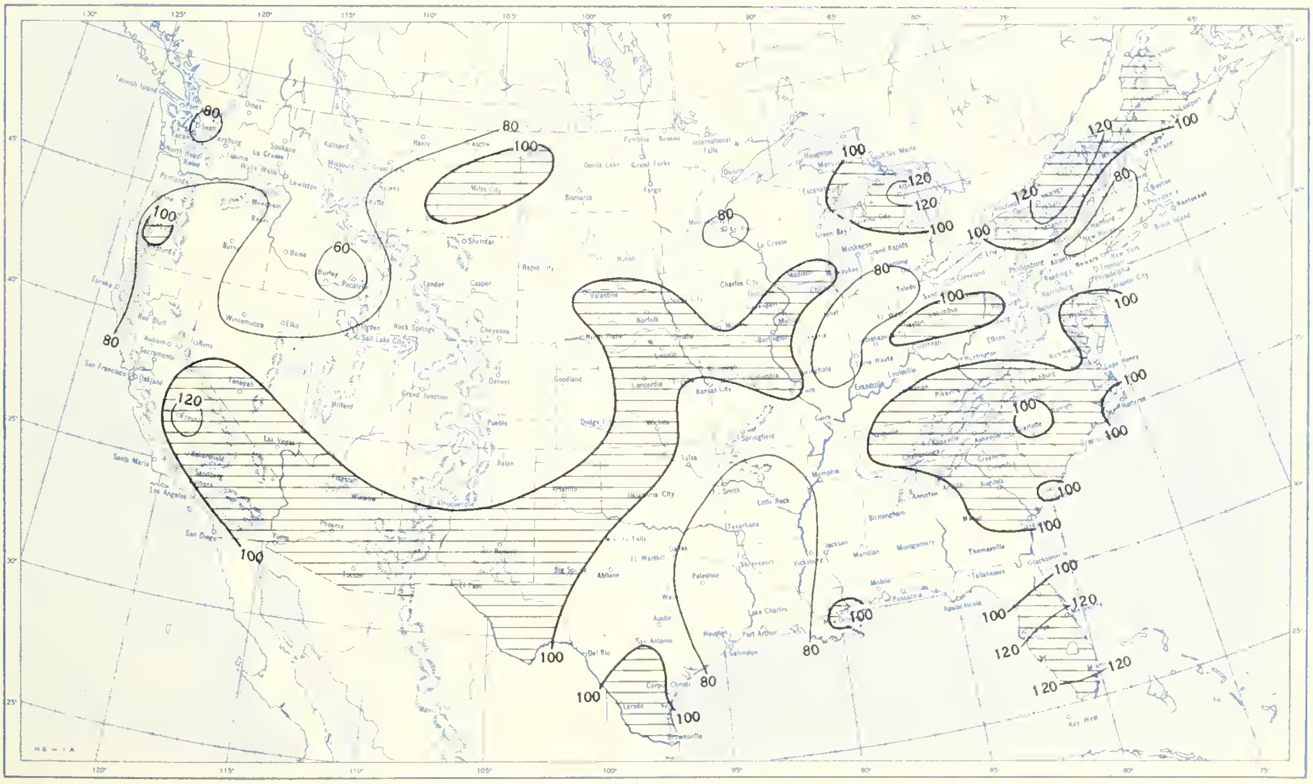


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, January 1954.



B. Percentage of Normal Sunshine, January 1954.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, January 1954. Inset: Percentage of Normal Average Daily Solar Radiation, January 1954.

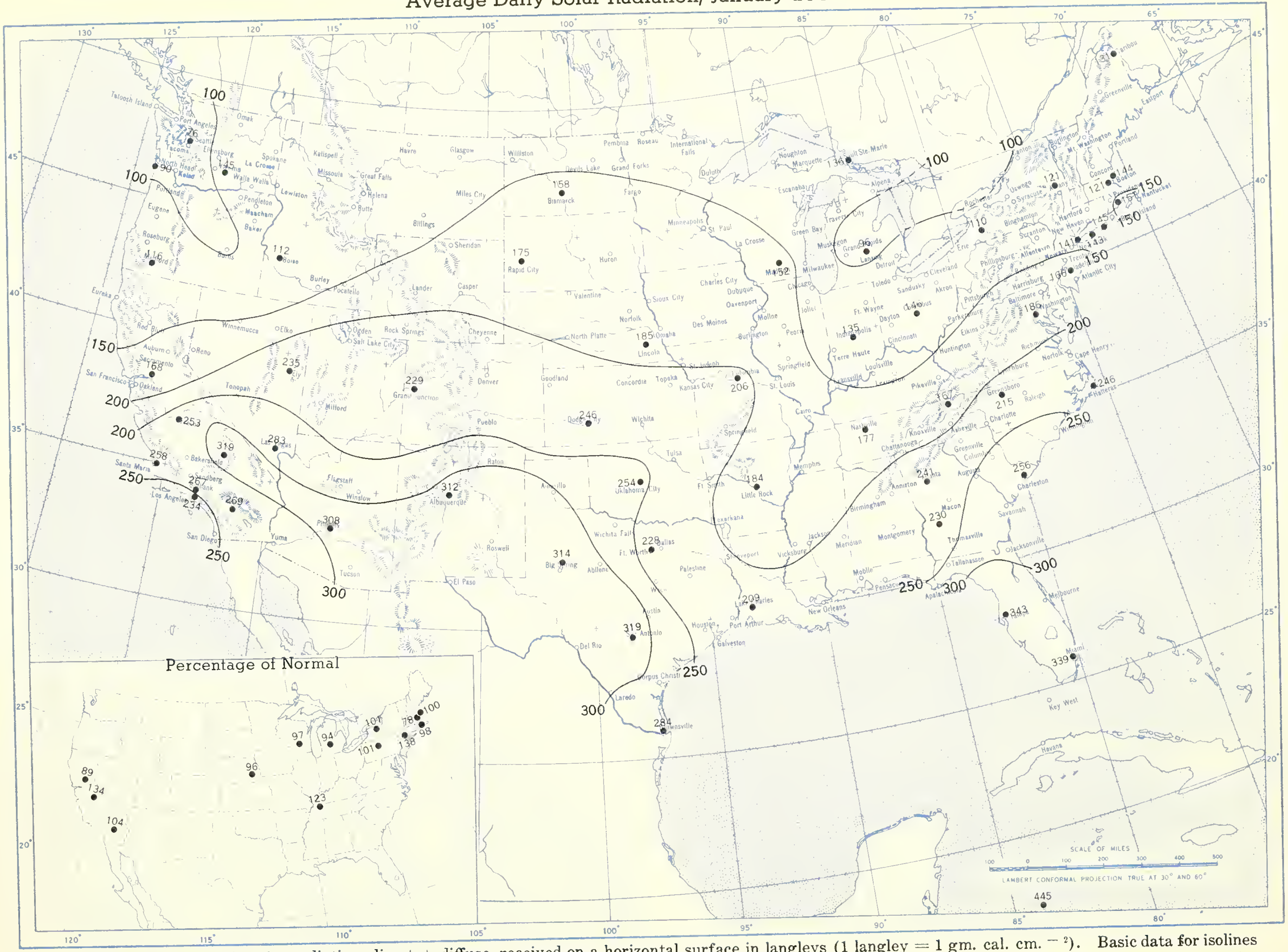
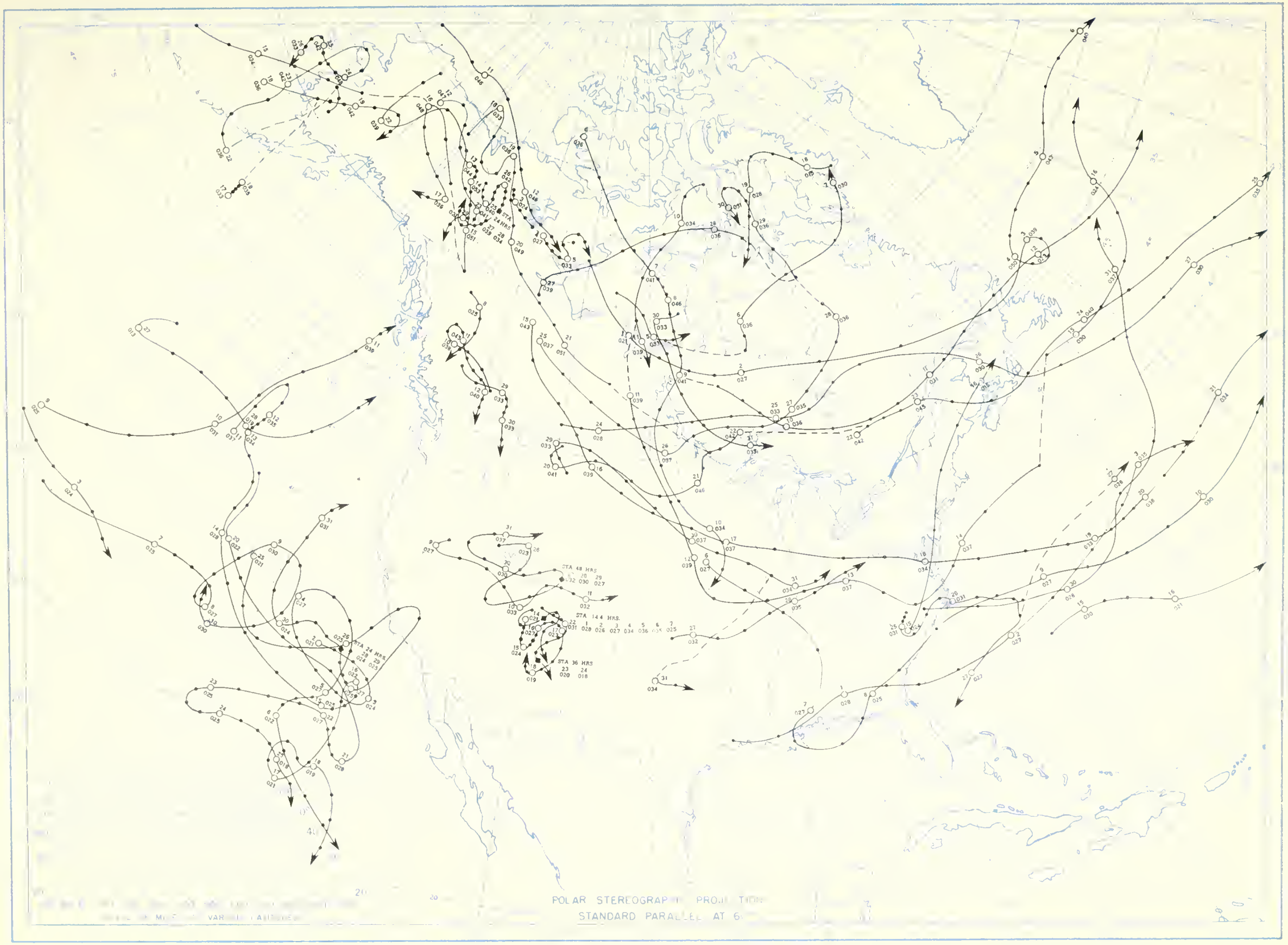


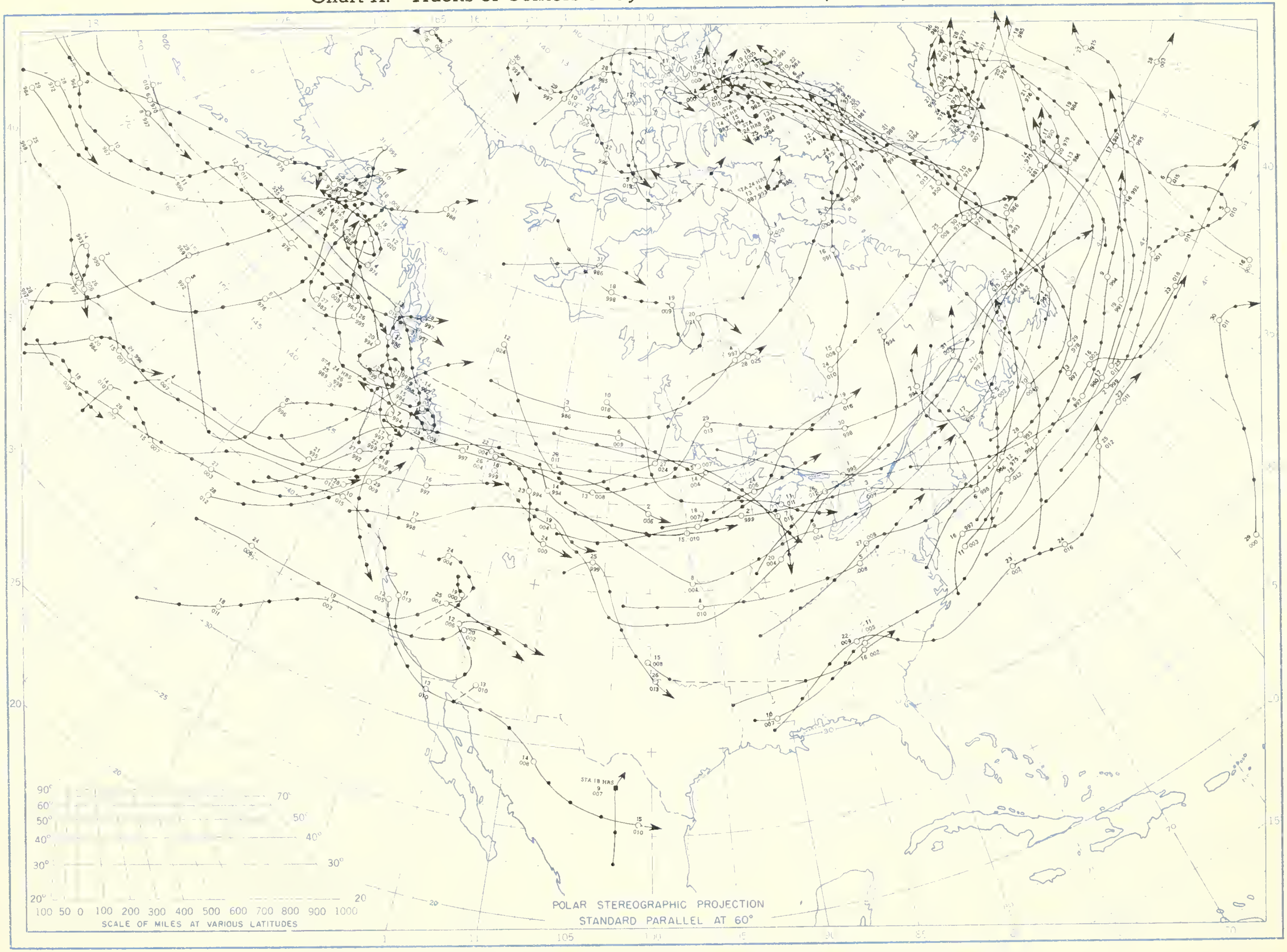
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm. $^{-2}$). Basic data for isolines are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are computed for stations having at least 9 years of record.

Chart IX. Tracks of Centers of Anticyclones at Sea Level, January 1954.



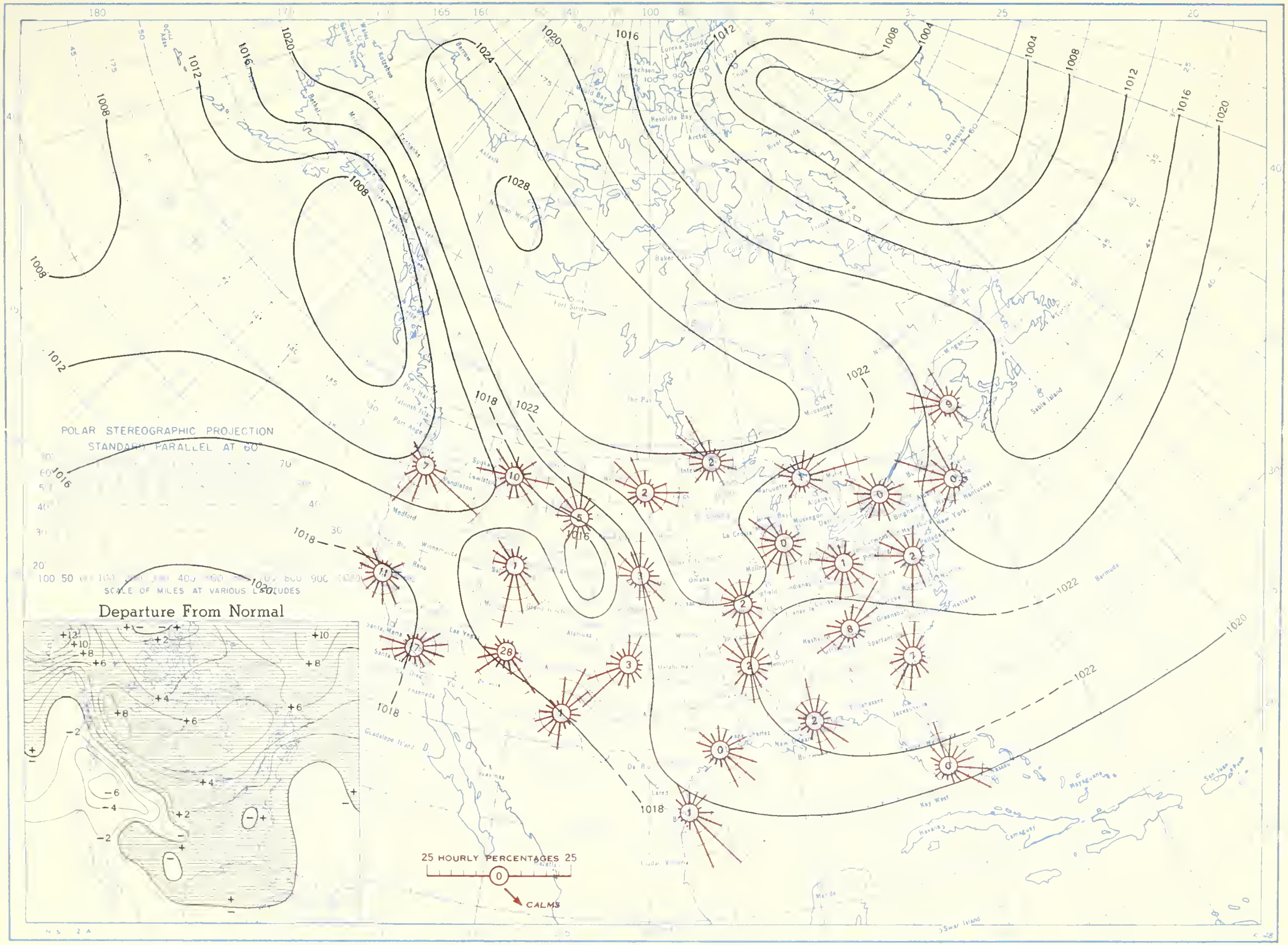
Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

Chart X. Tracks of Centers of Cyclones at Sea Level, January 1954.



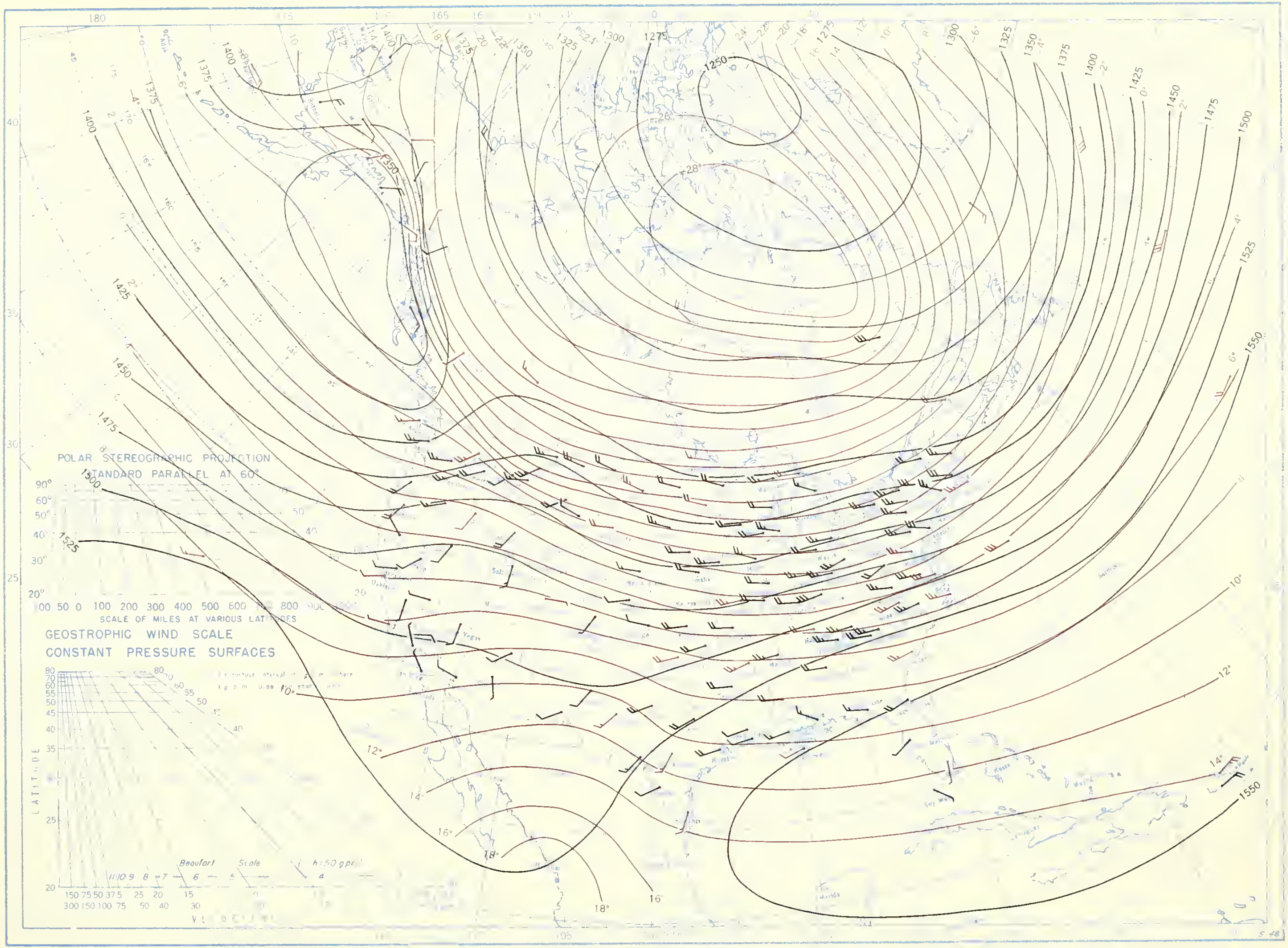
Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, January 1954. Inset: Departure of Average Pressure (mb.) from Normal, January 1954.



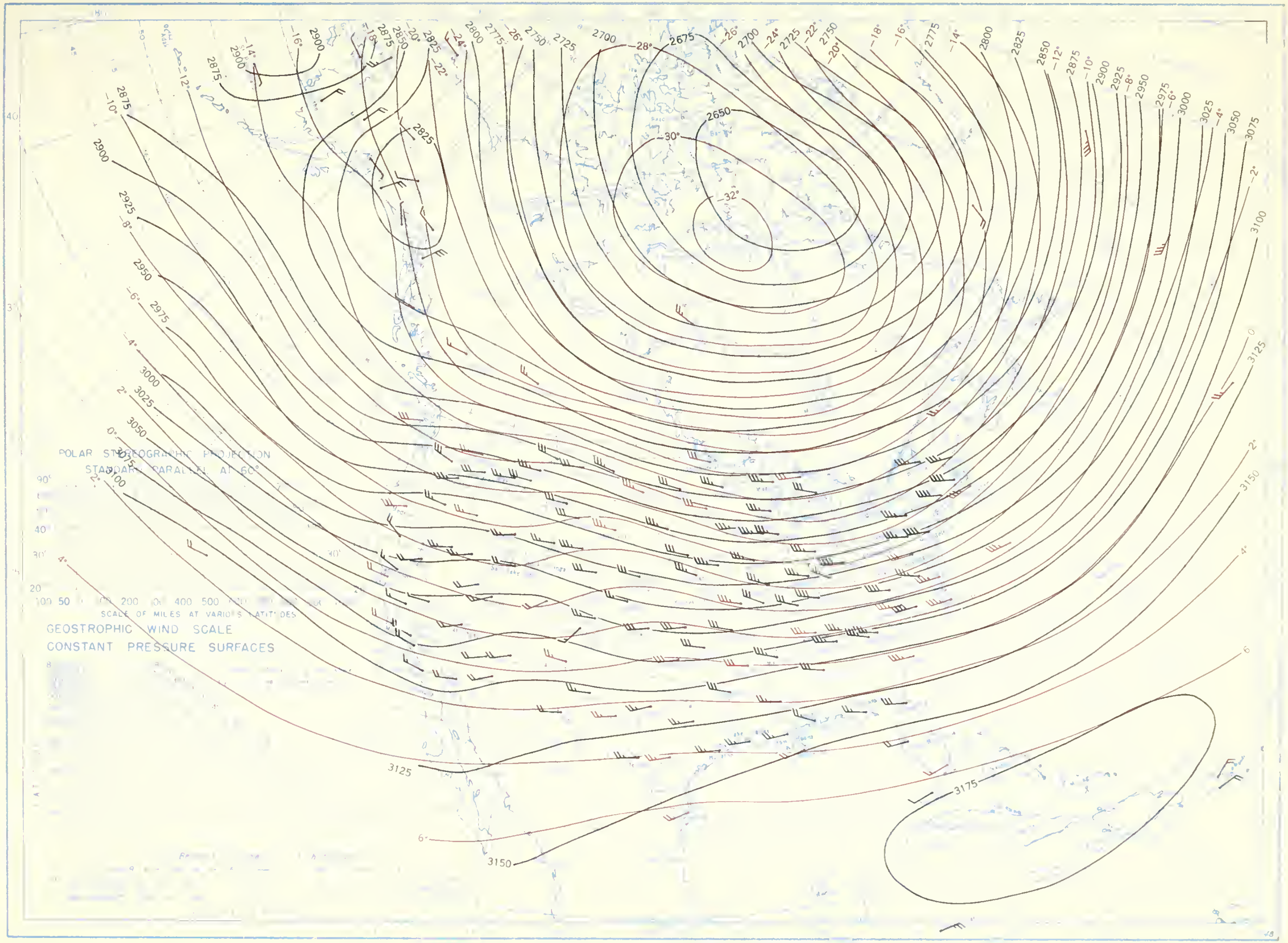
Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), January 1954.



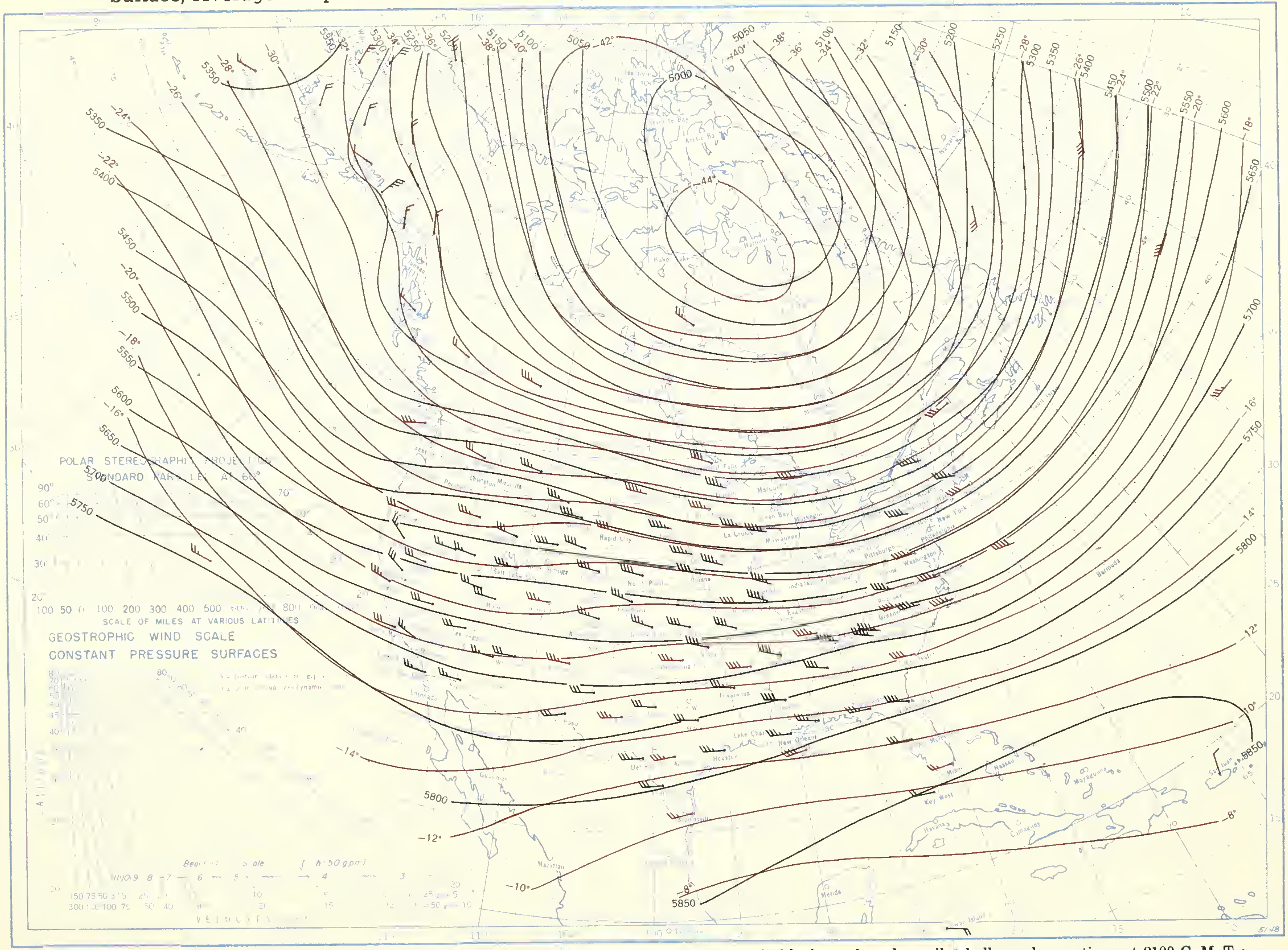
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m.. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), January 1954.



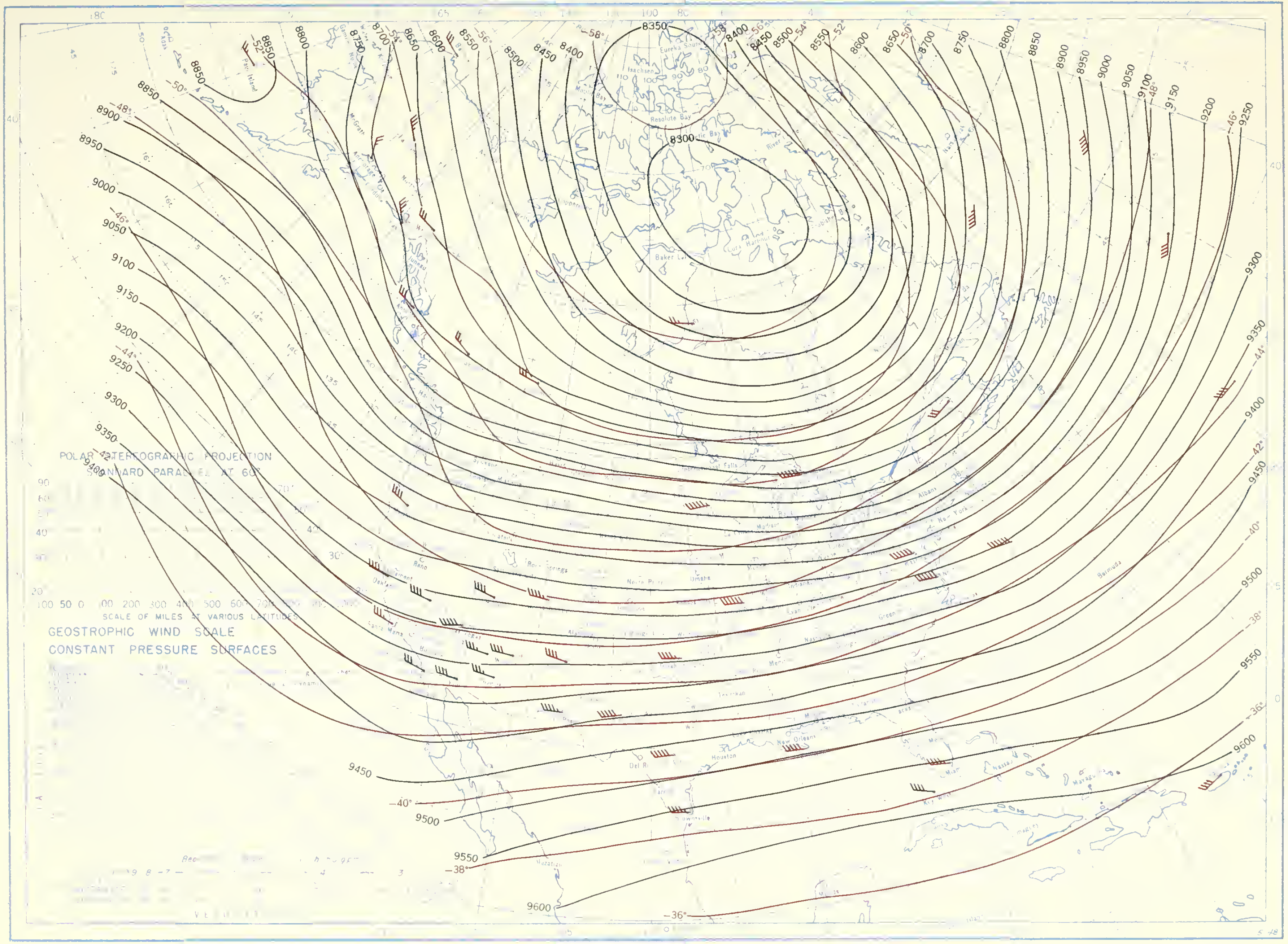
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), January 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 300-mb. Pressure Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), January 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

FEBRUARY 1954
Volume 5 No. 2

ASHEVILLE: 1954

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CHARTS I-XV

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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CLIMATOLOGICAL DATA
NATIONAL SUMMARY

Volume 5 No. 2 FEBRUARY 1954

GENERAL SUMMARY OF WEATHER CONDITIONS

February 1954 was notable for its mildness. For the Nation as a whole the temperature for the month averaged 42.8°, which exceeded the long-term mean by 8.1°, the previous highest average in 1930 by 1.2°, and the record-low average in 1930 by 16.0°. Also this national average was as high as that for a normal March, and only slightly lower than the normal temperature for November.

As a result of the unseasonably mild temperatures, which persisted virtually throughout the month in northern areas, ice deterioration in lakes and streams began unusually early, frost left the ground in some sections on the earliest dates of record, and heating requirements were reduced as much as 25 percent. At the end of the month early flowers and fruit were blooming in Sacramento, Calif., (2 weeks early), Memphis, Tenn., Little Rock, Ark., and Oklahoma City, Okla., and tree buds were swelling as far north as Pennsylvania and the deeper valleys of southern Idaho.

In the Missouri River ice broke up at Sioux City, Iowa, on the 20th (one of the earliest dates on record), and in South Dakota the break-up began at Pierre on the 20th, and Mobridge on the 25th. Only twice previously (in 1931 and 1934) during the past 26 years has ice in South Dakota broken up in February. The Mississippi River was free of ice at Davenport, Iowa, by the 16th, movement began at LaCrosse, Wis., on the 17th (average date March 22), and at Minneapolis-St. Paul, Minn., the main channel was open and only shore ice remained at the end of the month. In southern New Hampshire, Concord reported ice out of the rivers by the 24th.

Frost-free soil permitted plowing during the closing days of the month in some sections of southern and southwestern North Dakota, and there were scattered reports of disking and harrowing in extreme southern Minnesota on the 18th and 19th, which were unusually early dates for fieldwork.

The worst feature of the month's weather was the continued drought in the central and lower Great Plains where the lack of moisture and the additional effect of high winds and severe duststorms caused further deterioration of small grains and pastures. Precipitation was much below normal in most of the Country, but in sections other than the lower Great Plains crops were dormant or moisture conditions were satisfactory owing to previous precipitation.

Sunshine was well above normal, except along the Canadian Border and in the Central Valley and north coastal sections of California where it was slightly below normal. Sunshine was the greatest of record at Port Arthur, Tex., (70 percent of possible): Albuquerque, N. Mex., (92 percent of possible): and the second greatest at Yuma, Ariz., (97 percent of possible): and at Las Vegas, Nev., 100 percent of possible sunshine occurred on 20 days.

Thunderstorms were more frequent than usual in the Missouri, central Mississippi, and lower Ohio Valleys, in southern Michigan and the western Carolinas, and were reported by several stations in Montana where thunderstorms rarely occur in February. The first thunderstorm on record for February at Kalispell, Mont., was reported on the 24th.

Total wind movement for the month generally was above normal in the Great Plains and Northwest where the wind occasionally reached speeds in excess of 60 m.p.h., causing minor damage over extensive areas. At Great Falls, Mont., the wind for the month averaged 21.4 m.p.h. (greatest in 10 years), and gusts of 73 and 74 m.p.h. occurred on the 24th and 25th respectively. Other cities reporting gusts exceeding 60 m.p.h. on one or more dates were Dodge City, Kans., Reno, Nev., El Paso, Tex., and Seattle, Wash. At the latter station speeds of 30 m.p.h. or over occurred on 13 days.

Fog persisted over much of the far West during the first decade when an area of high barometer was centered over the Intermountain region. At San Diego, Calif., fog occurred on 7 days (5 more than normal for the month), and on several days at Salt Lake City, Utah, Missoula, Mont., Red Bluff, Calif., and Lewiston, Idaho. At Yakima, Wash., fog and low clouds persisting from the 1st through the 12th restricted airline flights.

PRECIPITATION.--Precipitation, while subnormal over most of the Country, was above normal in several northern districts where light rain or snow occurred rather frequently.

The most important deficiencies occurred in the western portion of the lower Great Plains. The month's fall was less than 25 percent of normal in this region as well as in most of Louisiana and eastern Texas. Statewide averages for Colorado (0.27 inch) and Louisiana (1.34 inches) were the lowest on record for February. In most of the region from southwestern Nebraska southward where total precipitation for the 11-week period ending February 28 generally was less than one-half inch and in some sections less than one-tenth inch. the topsoil had become loose and dry: consequently, during periods of high winds the latter part of the month, severe erosion occurred. Drifting sand and dust were piled as high as fences in many places. These duststorms, reported as the worst since the 1930's, reduced visibility to one-sixteenth mile or less over large areas and dust in the upper air was noticeable as far east as the Atlantic Coast.

In extreme eastern portions of Kansas and Nebraska, parts of Minnesota and Iowa, and nearly all sections east of the Mississippi precipitation which generally exceeded an inch maintained ample topsoil moisture and helped replenish the subsoil moisture in the Ohio and central Mississippi Valleys.

TEMPERATURE.--Temperatures averaged above normal everywhere except in the lower portion of the Florida Peninsula and the Central Valley of California where they were slightly below normal. Above-normal departures, higher in northern areas east of the Continental Divide than elsewhere, ranged up to 21° at Bismarck, N. Dak., and 11° at Caribou, Maine. The month was the warmest February on record in the North-Central Interior, in many parts of the Northeast, and in some sections of the Southwest.

Among the many stations in these regions reporting record high average temperatures for February were the following: San Diego, Calif., 61.2°: Phoenix, Ariz., 61.1°; Albuquerque, N. Mex., 46.8; Oklahoma City, Okla., 52.1°; Sheridan, Wyo., 38.7°; Havre, Mont., 37.1°: Bismarck, N. Dak., 33.9°; Lincoln, Nebr., 42.0°: La Crosse, Wis., 32.8°; Grand Rapids, Mich., 34.3°; Buffalo, N. Y. 33.1°: Hartford, Conn., 36.2°; and Philadelphia, Pa., 42.4°. Statewide averages were the highest on record for Montana, Wyoming, Colorado, the Dakotas, Nebraska, Iowa, Wisconsin, Michigan, and New York, and equaled the previous records for Minnesota, Missouri, and Illinois.

Record breaking high temperatures (single readings) were reported by only a few stations, among which were Corpus Christi, Tex., (96° on the 27th), Los Angeles Calif., (91° on the 7th), and Syracuse, N.Y., (66° on the 28th). But rarely, if ever, have above-normal readings during a winter month been as persistent as they were this February, particularly in the northern Great Plains where daily averages were above normal every day except the 11th.

In most of the Country the coldest weather occurred on the 8th and 9th or 11th and 12th. Freezing was widespread during both periods, but extended to the Gulf coastal stations only in the first period when some flowers and other tender plants were reported damaged at Corpus Christi, Tex. During the second period subzero minima occurred over much of the North-Central Interior and Northeast. Monthly extremes ranged from 99° at Eagle Pass, Tex., on the 27th to -39° on the 13th in northern New York where an unofficial reading of -46° was reported from Forestport.

SNOWFALL.--Seldom has February snowfall been less than it was in 1954. Monthly totals were above normal only in northern portions of New England and New York State, the southern portion of the Great Lakes region, northeastern Minnesota, and a few other widely scattered areas. In much of the remainder of the Country snowfall was less than 25 percent of normal. The Statewide average for Colorado, 3.3 inches, was the lowest on record for February, for Utah, 3.1 inches was the second lowest, and for Maryland, Delaware, and Virginia averages were less than an inch. In North Dakota the greatest monthly total was only 5 inches and many stations reported no snowfall at all. Monthly totals were less than one-half inch at many other stations in the northern Great Plains, and they were generally less than an inch in Atlantic coastal areas as far north as southern New England. Evansville, Ind., had no snow at all: Helena, Mont., only 2 percent of normal: Bismarck, N. Dak., 6 percent; Denver, Colo., 8 percent: and Kansas City, Mo., 4 percent.

Snowfall in the far West generally was limited to mountainous areas, the heaviest falls occurring in the Cascades where several stations reported monthly totals ranging from 50 to 100 inches. At the end of the month the mountain snowpack was generally normal or above in northern areas but below in the south.

During a heavy snowstorm in the central Great Plains on the 19th and 20th up to 8 inches fell in southwestern Kansas and eastern parts of Nebraska and South Dakota. In Iowa, during another storm on the 25th, 8- to 12-inch falls were numerous in a band extending from Sioux County to Clinton County.

In northern New York and New England during a heavy storm from the 16th to the 18th, up to 3 feet of snow was reported in northern New York and as much as 2 feet in northern Vermont. On the 28th heavy snow fell in eastern Tennessee and western North Carolina; Asheville, N.C., reported 4 inches and some points in the Smokies up to 18 inches.

DESTRUCTIVE STORMS.--Severe local storms in February were numerous during the passage of a cold front across the eastern half of the United States on the 15th and 16th when tornadoes occurred in Arkansas and South Carolina and severe thunderstorms were reported from numerous localities east of the Mississippi. On the 15th a tornado wrecked a gymnasium at Clarksville, Ark., injuring 24 persons and causing $325,000 damage.

During another cold front passage from the Great Plains to the Atlantic Coast from the 19th to the 21st numerous storms again occurred. A tornado at Greenwood, Ark., on the 19th caused losses of $665,000, and another at Conroe, Tex., caused 7 injuries and losses of $200,000. On the same date the severest duststorm since the 1930's affected parts of 5 States in the lower Great Plains, tornado winds and lightning on the 20th injured 10 persons and caused $300,000 damage in Lamar, Jones, and Covington Counties, Miss., and $100,000 additional damage in Newton and Neshoba Counties.

Two severe hailstorms occurred, one at Fredonia, Kans., on the 15th causing losses of $115,000, and the other at Caruthersville, Mo., on the 27th, where $187,000 damage was reported.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

FEBRUARY 1954

Section	Temperature								Precipitation					
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes			
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least
	°F.	°F.		°F.			°F		In.	In.		In.		In.
Alabama	52.7	+3.6	Lockhart	83	°16	Russellville 2	17	8	3.16	-2.07	Maxwell Field	6.88	Mobile	1.20
Arizona	50.7	+5.7	Yuma WB AP	92	25	2 Stations	-3	16	.57	-.69	Bright Angel RS	2.08	2 Stations	.00
Arkansas	50.7	+7.0	Camden 1	86	10	Gilbert	12	°8	2.24	-1.35	Des Arc	5.20	Fort Smith WB AP	.55
California	51.2	+4.1	Mecca	98	24	Soda Springs	-11	15	2.96	-1.06	Strawberry Valley	13.75	5 Stations	.00
Colorado	37.4	+10.1	Eversoll Ranch	83	13	Taylor Park	-30	16	.27	-.74	Independence Pass	1.88	9 Stations	.00
Connecticut	35.0	+8.0	2 Stations	77	16	3 Stations	-8	°1	2.08	-1.35	Groton	3.49	Waterbury City Hall	.88
Delaware	41.7	+6.8	5 Stations	75	°15	2 Stations	6	13	1.43	-1.73	Wilmington Nwcsl WBAP	1.82	Newark Coll. Farm	1.03
Florida	62.1	+1.4	Tamiami Trl. 40 Mi. Bend	89	18	De Funiak Springs	23	8	2.02	-1.02	Dry Tortugas	4.95	Cedar Key	.40
Georgia	53.5	+3.6	2 Stations	82	°15	Blairsville Exp. Sta.	13	8	2.06	-2.56	Titus	5.30	Cordele	.44
Idaho	34.0	+6.0	do	69	°23	Island Park Dam	-20	19	1.23	-.49	Burke 2NNE	5.44	Swan Falls PH	.07
Illinois	40.4	+10.5	E.St.Louis Parks Col.	77	15	Stockton	0	12	1.84	-.08	Syreator	3.79	Rockport	.56
Indiana	39.8	+9.2	3 Stations	74	15	Rochester	-1	12	2.46	+.06	Elkhart	4.48	W. Lafayette CAA AP	1.32
Iowa	37.0	+14.4	Sidney	73	14	4 Stations	-5	12	1.46	+.37	Oakland 2E	3.19	New Hampton	.16
Kansas	46.0	+12.0	Medicine Lodge	89	14	2 Stations	8	7	.83	-.15	Ottawa	2.59	9 Stations	T
Kentucky	44.7	+7.2	Madisonville 1SE	79	27	Clermont 1SSE	9	12	2.23	-1.24	Bowling Green CAA AP	4.13	Greenup Dam 30	.24
Louisiana	58.1	+3.4	3 Stations	85	°27	Belah Fire Tower	16	8	1.34	-3.25	Plain Dealing	3.26	Hackberry	.25
Maine	26.5	+8.1	5 Stations	59	°19	2 Stations	-26	°1	4.09	+1.13	Machias	6.11	Presque Isle	2.31
Maryland	41.1	+7.3	2 Stations	80	°16	Sines Deep Creek	-3	13	1 26	-1.61	Clear Springs	2.06	Loch Raven Dam	.32
Massachusetts	33.9	+7.3	Rochester	67	17	West Cummington	-18	13	2.83	-.55	Middleton	4.15	West Otis	1.76
Michigan	30.0	+9.9	2 Stations	68	15	Lupton 1SW	-18	12	2.35	+.71	Albion	5.58	Ironwood	.58
Minnesota	27.4	+15.1	Windom	66	14	Detroit Lakes 1NE	-32	12	.85	+.10	Pipestone	1.76	Red Lake Falls	.03
Mississippi	54.5	+4.8	Crystal Springs	85	15	Water Valley	18	8	2.44	-2.55	Mt. Pleasant	5.85	McHenry 5ESE	.69
Missouri	44.5	+10.8	Anderson 1SW	83	10	2 Stations	7	°7	1.72	-.38	Centerville RS	3.82	Jefferson City	.46
Montana	34.8	+13.8	Grass Range	72	7	West Yellowstone	-18	19	.62	+.01	Essex	6.30	Joplin 21N	.00
Nebraska	41.7	+15.1	Pawnee City	78	14	Gordon 1E	2	28	.72	+.03	Nebraska City	3.80	13 Stations	.00
Nevada	41.2	+6.1	2 Stations	84	°25	Ely WB AP	-1	19	.58	-.43	Glenbrook	2.80	2 Stations	.00
New Hampshire	28.1	+8.2	4 Stations	62	°19	First Conn. Lake	-26	1	3.17	+.48	Pinkham Notch	5.97	Bethlehem	2.08
New Jersey	38.7	+7.6	2 Stations	77	16	2 Stations	-5	13	1.84	-1.54	Long Valley	2.93	Cedar Grove	.95
New Mexico	44.0	+5.6	3 Stations	83	°23	Eagle Nest	-11	16	.10	-.54	Lake Maloya	1.70	44 Stations	.00
New York	30.5	+8.2	Glenham	78	17	2 Stations	-39	13	3.13	+.51	Highmarket	8.05	West Cameron	1.03
North Carolina	47.4	+3.9	5 Stations	79	°16	Celo 2S	4	8	2.25	-1.66	Coweeta No. 8	8.60	2 Stations	.72
North Dakota	30.4	+19.9	Mandan Ft.Lincoln Pk.	64	18	Willow City	-27	12	.23	-.24	Belfield	1.20	Nortonville	.00
Ohio	38.1	+7.8	Portsmouth Area WB	79	15	Mansfield 6W	-7	7	1.60	-.77	Napoleon	4.19	New Lexington 2NW	.27
Oklahoma	51.9	+9.2	Waynoka	92	15	Cushing	12	7	.55	-1.06	Valliant	4.47	3 Stations	.00
Oregon	39.6	+3.8	Brookings	73	25	Fremont	5	5	2.56	-.76	Valsetz 2E	17.03	2 Stations	.07
Pennsylvania	35.6	+6.9	2 Stations	79	16	Bradford 4W Res.	-11	13	1.89	-.87	2 Stations	4.21	Kegg	.62
Rhode Island	35.9	+6.7	Greenville	71	16	Greenville	-5	13	2.72	-.78	Austin	3.49	Kingston	2.63
South Carolina	51.6	+3.6	Ridgeland 2SE	81	15	Union 7SW	17	13	1.58	-2.46	Caesars Head	6.44	Charleston WB City	.42
South Dakota	37.8	+18.5	2 Stations	75	°8	Britton	-8	12	.53	-.02	Centerville	3.53	Zeona	T
Tennessee	47.2	+5.7	6 Stations	79	27	Crossville Exp. Sta.	10	8	3.70	-.81	Columbia 1WSW	7.25	Boone Dam	.78
Texas	56.5	+6.0	Eagle Pass	99	27	3 Stations	14	°12	.31	-1.25	Boxelder	2.94	Numerous	.00
Utah	36.1	+6.0	Mexican Hat	78	26	Woodruff	-13	9	.55	-.71	Alta	6.65	7 Stations	.00
Vermont	26.1	+7.7	Pennington 2NW	64	28	Enosburg Falls	-34	13	3.58	+1.08	Montpelier CAA AP	4.79	Lemington	2.35
Virginia	43.1	+5.6	3 Stations	79	°15	Burkes Garden	1	8	1.68	-1.31	Montebello 3NE	4.52	Fairfax	.42
Washington	37.4	+2.8	2 Stations	69	°6	2 Stations	-7	11	4.05	+.52	Spruce	25.01	Richland	.18
West Virginia	39.7	+5.9	do	79	16	Kumbrabow St. Forest	-8	8	1.45	-1.62	Pickens 1	4.29	Upper Sycamore Cr.	.38
Wisconsin	29.4	+12.8	Kenosha	64	15	Long Lake Dam	-28	12	.80	-.40	Burlington	E1.94	Dodge	.14
Wyoming	33.2	+11.0	Yoder	76	13	Bondurant	-27	9	.47	-.31	Moose 3NW	5.19	2 Stations	.00
Puerto Rico	72.9	+.3	Juncos	95	6	Jayuya	48	°1	5.39	+2.20	Saint Just	19.55	Coamo Dam	1.05

° Other dates also.
E Water equivalent of snowfall wholly or partly estimated, using a ratio of 1 inch of water equivalent to every 10 inches of new snowfall.

Note: Dates in Table 1 apply to the period 24 hours prior to time of observation. In some cases the actual occurrence is on the calendar date preceding that shown. (See individual Climatological Data for times of observations).

CLIMATOLOGICAL DATA

Table 2

FEBRUARY 1954

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days: Max. 90° F. or above	No. of days: Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days: .01 inch or more	No. of days: With thunderstorms	Snow, Sleet, Hail: Total	Snow, Sleet, Hail: Max. depth on ground	Average hourly speed	Prevailing direction	Fastest mile: Speed	Fastest mile: Direction	Fastest mile: Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0-3	4-7	8-10	0-10	%
ALABAMA																																
Birmingham	610	991.2	1016.7	65	38	51.2	+3.5	77	27	21	8	0	10	36	61	3.37	-1.80	0.98	6	3	T	0	8.3	S	48	SW	28	12	10	6	4.3	75
Mobile	211	1010.2	1018.3	70	46	57.7	+2.7	78	27	27	8	0	1	45	68	1.54	-3.02	.99	5	3	.0	0	13.8	SSW	---	---	--	14	9	5	4.1	--
Montgomery CO	201	------	------	67	44	55.3	+2.7	79	27	26	8	0	1	--	--	3.26	-1.53	1.50	7	2	.0	0	----	---	---	---	--	--	--	--	---	--
Montgomery	198	1009.8	1017.5	67	41	54.3	+2.7	79	°27	26	8	0	5	40	64	3.40	-1.33	1.53	7	2	.0	0	11.0	SW	32	S	°28	15	7	6	3.9	75
ARIZONA																																
Flagstaff	6993	------	------	51	18	34.6	+5.8	61	°24	0	16	0	27	--	--	1.27	-.47	1.25	2	0	16.0	16	----	---	---	---	--	21	4	3	1.9	--
Phoenix	1114	978.0	1017.3	76	46	61.1	+6.8	85	23	36	20	0	0	35	46	.58	-.21	.58	2	0	.0	0	5.1	SE	*21	NE	27	21	5	2	1.8	96
Prescott	5014	849.6	1019.9	63	29	45.7	+6.3	72	25	20	20	0	24	17	38	.81	-.52	.81	2	0	1.6	T	7.5	SW	40	SW	13	21	6	1	1.8	92
Tucson	2558	928.2	1016.5	76	45	60.3	+7.1	83	°6	31	20	0	1	21	34	.75	-.17	.75	2	0	.0	0	7.5	ESE	30	SE	16	20	6	2	2.1	96
Winslow	4880	854.7	1020.0	61	26	43.1	+3.3	73	12	16	°20	0	24	14	36	.24	-.23	.24	1	0	1.5	2	7.1	SE	*43	W	26	20	8	0	1.8	--
Yuma	199	1011.5	1016.7	82	51	66.6	+6.5	92	25	40	17	3	0	26	26	.05	-.24	.05	1	0	.0	0	9.5	N	32	N	27	21	5	2	2.0	97
ARKANSAS																																
Fort Smith	458	998.6	1015.8	65	35	49.9	+5.3	78	10	20	8	0	13	33	58	.55	-2.49	.55	1	2	.0	0	9.9	W	30	SW	14	17	6	5	3.6	72
Little Rock	257	1002.7	1015.9	64	39	51.7	+6.1	82	9	23	8	0	4	34	54	3.80	-.26	2.44	4	3	.0	0	11.1	SW	37	NW	27	13	8	7	4.2	68
Texarkana	361	1002.7	1016.5	68	42	54.8	+5.3	84	9	25	8	0	4	37	53	1.92	-2.18	1.07	3	3	.0	0	----	---	---	---	--	17	6	5	3.3	--
CALIFORNIA																																
Bakersfield	489	1003.7	1022.0	63	41	52.1	-.4	77	°23	31	9	0	1	44	77	.25	-.87	.21	4	0	.0	0	3.0	ENE	*24	SSE	13	11	10	7	4.6	--
Bishop	4103	878.1	1020.8	66	27	46.4	+5.1	76	8	21	15	0	26	--	--	2.21	+1.30	2.08	3	0	T	0	----	---	---	---	--	18	7	3	2.6	--
Blue Canyon	5280	839.8	1017.4	55	38	46.6	+10.5	73	8	19	18	0	8	--	--	10.39	+.92	3.49	6	0	52.9	29	----	---	---	---	--	15	5	8	4.1	--
Burbank	699	992.2	1018.4	76	48	62.0	+8.0	91	23	39	°15	1	0	38	48	3.05	-.01	2.58	3	0	T	0	4.1	S	*32	NNW	18	18	6	4	3.2	--
Eureka CO	43	1019.0	1021.7	54	43	48.3	-.1	61	12	37	27	0	0	--	--	3.29	-2.36	1.56	7	2	.0	0	7.3	---	39	SW	12	3	6	19	8.0	35
Fresno	331	1008.8	1021.1	60	40	49.6	-1.1	74	25	32	19	0	1	43	82	1.13	-.53	.51	5	0	T	T	4.4	SE	35	SW	14	10	8	10	5.5	57
Los Angeles CO	312	------	------	76	53	64.1	+7.7	90	23	44	15	1	0	38	47	2.98	-.39	2.88	4	1	T	T	6.6	---	30	W	14	17	7	4	2.8	88
Los Angeles	99	1014.6	1018.3	72	50	60.8	+6.7	91	7	43	°15	2	0	42	59	3.35	+.61	3.28	3	0	.0	0	6.3	W	†42	S	13	17	7	4	3.1	--
Mt. Shasta	3543	896.0	1021.9	52	30	41.1	+1.2	70	23	22	18	0	21	--	--	6.07	+.85	3.59	7	1	6.2	9	----	---	---	---	--	10	7	11	5.3	--
Oakland	3	1020.3	1020.7	62	42	51.7	+1.0	77	25	36	°6	0	0	44	76	1.93	-1.47	.98	5	0	T	T	5.0	WNW	*38	S	17	16	5	7	3.5	--
Red Bluff	341	1007.8	1020.7	62	42	51.6	+1.7	79	24	35	°18	0	0	40	72	3.00	-.53	1.53	12	2	T	T	8.8	SSE	49	SE	12	9	9	10	6.0	63
Sacramento	17	1019.6	1021.0	57	41	48.8	-.9	74	25	33	18	0	0	43	82	3.58	+.82	1.60	8	0	.0	0	7.9	SE	43	S	12	10	2	16	6.3	44
Sandberg CO	4517	865.9	1019.2	57	42	49.5	+8.7	68	25	26	18	0	4	21	41	1.91	-.81	1.82	3	0	.6	T	20.6	ENE	---	---	--	19	5	4	2.8	--
San Diego	19	1014.9	1018.2	72	50	61.2	+4.9	88	7	45	19	0	0	44	60	1.03	-1.23	1.03	2	0	.0	0	5.6	NE	31	S	13	16	10	2	3.1	81
San Francisco CO	52	------	------	61	47	54.0	+1.0	74	°24	42	5	0	0	--	--	2.42	-1.49	1.35	6	0	.0	0	7.4	---	35	SW	17	17	3	8	3.6	77
San Francisco	1	1019.6	1020.4	61	42	51.1	+.3	74	25	36	19	0	0	44	79	2.36	-1.08	.92	5	1	T	0	8.6	SE	47	SSW	12	15	6	7	3.9	--
Santa Maria	231	1010.5	1019.3	72	42	56.9	+5.1	86	7	35	15	0	0	41	62	1.28	-1.19	.92	5	0	.0	0	8.6	E	*28	NNE	19	17	4	7	3.3	--
COLORADO																																
Alamosa	7534	772.4	1022.0	50	15	32.6	+9.6	60	23	2	28	0	28	--	--	T	-.18	T	0	0	T	T	----	---	---	---	--	20	8	0	2.3	--
Colorado Springs	6175	810.4	1018.0	56	26	41.1	+9.3	71	13	9	28	0	23	11	33	.06	-.27	.04	3	0	.8	T	13.8	N	*52	W	24	18	9	1	3.1	--
Denver	5292	837.1	1015.5	60	28	43.7	+11.7	75	8	16	28	0	21	11	31	.04	-.49	.04	2	0	.6	T	13.5	S	45	N	19	11	9	8	4.7	87
Grand Junction	4849	863.2	1022.0	54	28	40.7	+8.7	64	26	19	28	0	25	20	47	.27	-.36	.20	3	0	1.0	T	7.9	ESE	50	NW	26	14	6	8	4.1	79
Pueblo	4799	856.8	1016.9	63	25	43.9	+9.8	76	8	9	28	0	23	18	39	.11	-.37	.11	2	0	2.2	2	9.5	WNW	52	SW	14	16	7	5	3.7	87
CONNECTICUT																																
Bridgeport	7	1013.2	------	45	29	37.1	+8.1	60	°22	5	13	0	17	--	--	1.44	-1.53	.73	7	0	.5	T	----	---	---	---	--	7	9	12	6.3	--
Hartford	15	1007.8	1014.0	47	26	36.2	+8.7	72	16	2	13	0	23	26	70	1.89	-1.14	.83	12	0	1.1	1	8.4	NW	35	NW	12	6	8	14	6.8	52
New Haven	6	1009.5	1013.5	44	29	36.7	+7.6	59	°22	6	13	0	19	--	--	1.49	-1.81	.77	9	0	.6	T	7.9	---	28	NW	12	6	11	11	6.4	56
DELAWARE																																
Wilmington	73	1011.2	1014.5	50	30	40.4	+6.7	74	16	9	13	0	19	30	68	1.82	-1.16	.87	7	0	.6	1	9.9	NW	---	---	--	9	6	13	5.7	--
DIST. OF COLUMBIA																																
Washington CO	72	------	------	53	35	44.0	+6.5	77	15	19	13	0	15	--	--	.82	-1.82	.57	5	--	T	T	8.5	---	35	W	26	--	--	--	---	--
Wash. Nat'l. AP	14	1010.8	1014.9	53	34	43.5	+6.4	76	15	19	13	0	15	29	58	.85	-1.59	.50	6	0	T	T	11.0	NW	49	NW	17	10	7	11	5.4	59
FLORIDA																																
Apalachicola	13	1015.9	1017.3	67	51	58.8	+1.9	74	17	36	8	0	0	--	--	1.61	-2.33	.73	5	3	.0	0	9.1	---	36	NW	24	16	6	6	3.3	69
Daytona Beach	31	1016.3	1017.9	73	50	61.2	+.7	83	17	38	7	0	0	51	75	.86	-1.54	.30	5	2	.0	0	12.2	SW	*40	S	20	15	9	4	3.7	--
Fort Myers	15	1017.3	1018.0	77	52	64.7	-.9	85	20	40	7	0	0	54	76	2.53	+.59	1.46	4	3	.0	0	9.1	E	*33	N	24	17	8	3	3.6	--
Jacksonville CO	18	------	------	71	51	60.5	+1.8	79	16	41	°6	0	0	--	--	1.32	-1.28	.57	8	--	.0	0	----	---	---	---	--	--	--	--	---	--
Jacksonville	24	1016.9	1018.1	71	48	59.6	+2.1	79	°28	37	6	0	0	46	67	1.74	-.92	.85	6	2	.0	0	10.1	WSW	33	W	28	13	12	3	3.9	69
Key West	9	1016.3	1017.3	77	65	71.1	-.5	83	°21	57	°26	0	0	--	--	4.29	+2.65	4.04	6	1	.0	0	8.5	NE	38	NW	8	20	4	4	3.4	72
Lakeland CO	214	------	------	73	53	63.2	-.2	83	17	44	°9	0	0	--	--	1.55	-.77	.82	6	4	.0	0	7.4	---	---	---	--	13	11	4	3.5	73
Miami CO	8	------	------	74	61	67.5	-1.2	80	18	51	°9	0	0	--	--	2.27	+.54	1.77	6	1	.0	0	12.6	S	36	SW	24	15	12	1	3.4	82
Miami	8	1016.3	1017.5	77	59	67.9	-.8	83	18	50	7	0	0	56	71	2.18	+.40	1.98	4	2	.0	0	9.9	ESE	*33	SW	24	13	14	1	3.8	--
Miami Beach	9	------	------	75	62	68.7	-1.5	81	12	53	9	0	0	--	--	1.81	+.06	1.76	6	0	.0	0	----	---	---	---	--	14	5	9	---	--
Orlando	103	1013.2	1018.0	74	50	62.2	-1.0	84	20	40	6	0	0	51	73	1.16	-.89	.42	6	1	.0	0	10.8	W	*40	S	24	15	11	2	3.4	--
Pensacola CO	13	1015.6	------	67	49	58.0	+2.0	75	27	29	8	0	1	--	--	2.27	-1.66	1.44	6	2	.0	0	9.2	---	25	W	24	13	8	7	4.3	73
Pensacola CAA AP	118	------	1017.8	--	--	----	----	--	--	--	--	--	--	47	--	----	-----	----	--	--	---	--	12.3	WNW	---	---	--	--	--	--	---	--
Tallahassee	64	1014.9	1017.5	70	43	56.9	+1.3	78	°16	32	6	0	1	44	68	1.69	-2.35	.93	5	3	.0	0	6.7	NW	---	---	--	15	6	7	4.0	--
Tampa	19	1016.6	1018.2	74	52	62.8	-.1	83	20	42	7	0	0	52	73	1.58	-.92	.70	6	1	.0	0	10.5	S	*50	NW	24	14	9	5	3.8	82
West Palm Beach	15	1016.3	1017.3	76	56	65.8	-1.9	83	18	42	°9	0	0	56	74	2.68	+.47	.91	10	3	.0	0	11.6	ESE	*33	SSW	24	9	15	4	4.5	--
GEORGIA																																
Albany	190	1010.2	1017.3	69	44	56.2	+2.7	79	°27	32	8	0	1	40	62	1.82	-2.43	.85	7	2	.0	0	6.3	SW	---	---	--	13	6	9	4.3	--
Atlanta CO	1054	------	------	60	41	50.4	+3.8	75	10	25	8	0	5	--	--	2.58	-2.07	1.02	5	--	---	--	----	---	---	---	--	--	--	--	---	--
Atlanta	977	974.6	1017.1	62	39	50.1	+3.4	76	10	26	8	0	6	36	63	2.70	-2.12	.84	5	2	T	0	12.7	NW	43	W	3	14	4	10	4.5	66
Athens	798	986.8	------	62	38	49.9	+3.3	75	10	25	1	0	6	--	--	1.61	-3.36	.72	5	2	.0	0	----	---	---	---	--	17	3	8	3.9	--
Augusta	143	1009.5	1016.5	66	38	52.2	+1.7	78	°15	23	1	0	7	39	67	2.84	-.89	.98	7	2	.0	0	7.9	WSW	*28	W	28	14	4	10	4.5	--
Columbus	385	1002.7	1016.9	66	38	52.1	+2.5	77	15	26	1	0	6	--	--	2.33	-2.34	.88	5	2	.0	0	----	---	---	---	--	15	4	9	4.1	--
Macon	356	1002.7	1016.4	67	41	54.1	+2.6	77	°27	28	1	0	4	39	62	1.63	-2.64	.48	7	3	T	0	11.0	WNW	45	W	3	15	2	11	4.3	71
Rome	637	993.2	1016.3	62	33	47.5	+2.5	75	15	19	13	0	15	--	--	2.73	-2.67	1.27	7	2	.0	0	----	---	---	---	--	12	6	10	4.6	--
Savannah	48	1014.2	1017.1	68	42	55.3	+1.4	78	10	27	1	0	1	45	73	1.41	-1.41	.94	9	0	.0	0	9.8	SW	29	N	3	15	6	7	4.0	72
Valdosta	200	1009.1	1017.5	71	44	57.3	+1.8	81	27	32	1	0	1	45	--	1.36	-2.38	.54	6	1	.0	0	9.5	SW	---	---	--	14	8	6	3.7	--
IDAHO																																
Boise	2842	925.5	1023.8	48	29	38.8	+4.8	63	23	20	8	0	21	29	71	.55	-.80	.25	8	1	T	T	10.0	SE	56	W	17	8	5	15	6.5	58
Lewiston	1413	968.2	1020.7	49	33	41.2	+5.3	62	17	20	11	0	12	--	--	.27	-.73	.15	5	0	T	0	----	---	---	---	--	0	6	22	8.6	--
Pocatello	4444	866.9	1023.2	46	25	35.2	+6.7	57	24	13	°8	0	23	24	65	.43	-.50	.25	5	0	1.6	1	12.7	SW	47	W	18	6	12	10	5.9	60
ILLINOIS																																
Cairo CO	314	1001.7	------	58	37	47.3	+6.7	73	15	23	12	0	8	--	--	2.47	-.86	1.54	5	1	T	T	11.6	---	43	SW	20	8	8	12	5.8	61
Chicago	610	989.8	1013.1	46	30	37.6	+10.2	69	15	9	12	0	16	26	66	2.40	+.99	1.00	10	1	8.2	4	12.6	NNW	32	SW	20	6	9	13	6.6	52
Moline	589	991.5	1014.3	46	27	36.3	+9.7	67	15	6	12	0	20	28	72	1.69	+.52	1.12	7	1	4.9	5	11.1	NW	34	SE	°19	6	8	14	6.5	45
Peoria	654	991.2	1014.0	47	28	37.5	+9.2	70	15	9	12	0	20	28	70	2.68	+.77	1.92	7	1	2.8	1	13.6	---	35	NE	16	6	6	16	6.9	51
Springfield	587	990.9	1014.5	49	29	39.3	+8.5	71	14	12	12	0	20	30	70	1.15	-.47	.74	8	2	.7	T	16.0	S	48	SE	19	6	7	15	6.7	54
INDIANA																																
Evansville	383	999.3	1015.4	55	34	44.5	+7.0	73	15	18	12	0	16	32	72	2.05	-.90	.93	7	2	T	T	13.1	SSW	54	SE	20	8	9	11	6.2	50
Fort Wayne	801	981.0	1013.0	45	28	36.3	+8.3	69	15	6	12	0	23	28	74	2.89	+1.12	.94	11	2	8.4	3	14.0	SW	41	SW	15	5	6	17	7.0	36
Indianapolis	793	984.1	1014.0	49	31	40.1	+8.6	72	15	12	12	0	18	29	68	2.64	+.56	1.27	13	2	1.6	1	14.3	SW	45	SW	20	9	4	15	6.4	52
South Bend	768	984.4	1013.1	43	27	34.8	+8.4	67	15	9	°7	0	23	28	75	4.01	+2.45	2.64	15	2	12.9	3	13.1	SW	*30	ESE	20	4	7	17	7.5	--

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
INDIANA (Cont.)																																
Terre Haute	578	994.6	1014.3	50	32	41.0	+8.6	70	15	12	12	0	17	31	71	2.34	+0.20	1.22	8	1	2.4	2	12.1	N	43	S	20	3	8	12	6.2	48
IOWA																																
Burlington	694	988.2	1014.4	49	27	37.7	+9.7	71	15	7	12	0	21	27	69	1.45	+.04	1.04	6	1	2.8	2	13.0	NW	35	W	8	6	10	12	6.2	68
Des Moines	948	982.7	1014.6	48	27	37.7	+11.7	68	14	9	12	0	21	26	66	1.35	+.27	.91	5	0	3.0	4	15.7	NNW	36	NW	21	9	10	9	5.6	61
Dubuque	1065	973.9	1014.2	42	25	33.7	+11.1	57	14	1	12	0	23	25	70	.46	-.65	.17	8	0	2.3	3	----	---	--	---	--	5	10	13	6.9	--
Sioux City	1094	972.2	1014.6	48	28	37.7	+14.5	63	18	12	12	0	20	26	68	2.48	+1.73	1.60	6	2	7.9	5	14.0	NNW	42	SE	[a]13	9	10	9	5.4	61
KANSAS																																
Concordia CO	1375	964.1	------	57	32	44.7	+11.8	77	14	16	[a]7	0	12	--	50	.77	-.08	.64	4	0	.8	T	10.0	---	34	N	19	16	7	5	3.3	81
Dodge City	2594	926.5	1015.6	60	31	45.7	+10.7	85	14	18	11	0	14	26	53	.60	-.18	.53	3	1	2.4	2	16.8	N	68	N	19	15	10	3	3.6	84
Goodland	3645	886.9	1015.5	58	26	42.0	+11.8	77	13	14	28	0	24	20	48	.03	-.45	.03	1	0	.4	T	12.2	WNW	*35	NNW	[b]19	8	13	7	5.0	--
Topeka	879	978.7	1015.1	57	32	44.4	+11.0	79	14	16	7	0	20	29	59	2.06	+1.09	1.42	4	2	T	T	11.3	S	37	S	15	12	5	11	5.0	65
Wichita	1321	965.8	1014.9	60	32	45.8	+8.6	80	14	17	7	0	15	28	53	.57	-.41	.57	1	1	T	T	15.4	S	37	N	19	15	7	6	3.6	89
KENTUCKY																																
Lexington	979	978.3	1014.9	54	32	42.9	+8.4	74	15	15	12	0	15	30	64	1.68	-1.82	1.03	6	2	1.7	1	15.7	SSW	--	---	--	8	8	12	6.1	--
Louisville CO	457	------	------	54	36	45.3	+7.5	70	15	20	12	0	6	--	--	1.88	-1.11	.94	6	--	T	0	----	---	--	---	--	--	--	--	---	--
Louisville	474	997.6	1014.1	55	34	44.6	+7.4	71	15	19	12	0	11	32	65	2.02	-.97	.88	8	2	T	0	10.9	NW	57	SW	25	7	10	11	6.1	56
LOUISIANA																																
Baton Rouge	64	1013.5	1017.2	72	46	59.2	+3.6	80	15	26	3	0	2	45	64	1.78	-2.58	1.28	4	3	.0	0	10.4	SW	--	---	--	16	9	3	3.4	--
Lake Charles	12	1016.3	1017.8	71	48	59.9	+4.0	79	16	30	8	0	1	46	64	.44	-4.09	.36	4	2	.0	0	9.3	SW	--	---	--	14	8	6	3.7	--
New Orleans CO	9	1015.6	------	72	52	61.8	+3.3	81	16	33	8	0	0	--	--	1.90	-2.28	1.27	3	1	.0	0	7.3	---	21	NW	28	13	7	8	4.0	78
New Orleans	3	1015.6	1017.7	72	48	59.8	+2.4	81	16	31	8	0	1	47	67	1.34	-2.63	.89	4	1	.0	0	11.3	SSW	*30	S	19	14	12	2	3.4	--
Shreveport	252	1007.5	1017.1	70	44	56.7	+5.0	83	[a]9	25	8	0	2	40	59	.90	-2.88	.64	3	2	.0	0	12.2	S	--	---	--	17	6	5	3.3	83
MAINE																																
Caribou	624	938.2	1012.4	29	13	21.2	+11.4	46	20	-18	[b]14	0	27	15	79	2.63	+.90	1.03	14	0	31.9	28	10.6	NW	*38	WNW	12	8	3	19	7.4	--
Portland	61	1008.5	1012.6	38	20	29.2	+7.7	57	19	-19	1	0	24	23	80	4.18	+.35	1.45	11	0	8.0	10	9.8	N	26	S	21	5	8	15	6.9	47
MARYLAND																																
Baltimore CO	14	------	------	53	36	44.8	+7.5	77	[b]16	18	13	0	9	--	--	1.07	-1.92	.74	6	--	----	--	----	---	--	---	--	--	--	--	---	--
Baltimore	146	1010.2	1015.1	51	30	40.9	+5.9	76	15	9	13	0	19	28	62	1.21	-1.78	.82	6	0	1.0	1	10.6	NW	54	NW	26	11	6	11	5.5	67
Frederick	294	------	------	51	28	39.1	+5.0	76	16	9	13	0	21	--	--	1.41	-1.17	.73	10	--	1.0	1	----	---	--	---	--	--	--	--	---	--
MASSACHUSETTS																																
Blue Hill Obs.	636	988.5	------	43	26	33.9	+8.2	62	16	-6	13	0	19	--	71	3.23	-.30	.84	11	0	1.8	3	15.8	NW	40	NW	[b]12	7	7	14	6.5	44
Boston	15	1008.1	1012.8	44	29	36.4	+7.2	61	21	-1	13	0	15	25	68	3.37	+.44	.81	15	1	1.9	1	12.6	WNW	40	NE	17	8	7	15	6.8	53
Nantucket	43	1012.2	1012.8	42	29	35.2	+4.1	52	16	2	13	0	18	30	81	2.36	-1.06	.86	9	1	.5	T	11.8	NW	35	NW	12	4	8	16	7.1	44
Pittsfield	1153	968.5	1012.2	38	21	29.4	+7.7	60	16	-11	13	0	26	--	--	3.14	+.63	.87	18	--	16.3	10	----	---	--	---	--	--	--	--	---	--
MICHIGAN																																
Alpena CO	587	989.2	------	35	23	29.0	+9.1	54	15	-3	12	0	26	--	--	1.18	-.27	.41	11	0	10.5	5	11.1	---	30	NW	21	3	7	18	7.6	37
Detroit	619	985.4	1013.0	40	27	33.5	+6.8	66	15	6	12	0	23	26	74	3.48	+1.46	1.71	15	2	10.4	4	11.8	NW	34	NW	11	6	5	17	7.0	45
Escanaba CO	594	988.8	------	35	21	27.7	+10.1	48	15	-5	12	0	27	--	--	1.53	+.16	.58	10	0	10.7	14	10.1	---	35	N	5	4	9	15	7.4	54
Grand Rapids	681	986.8	1012.8	40	25	32.6	+8.8	61	15	1	7	0	24	26	78	2.71	+1.04	1.15	15	3	10.9	6	11.5	W	34	SW	20	3	7	18	8.0	28
Lansing	859	980.0	1013.2	39	24	31.4	+7.2	60	15	0	12	0	24	25	76	4.21	+2.40	2.40	16	3	13.3	7	14.3	WNW	35	NE	16	4	8	16	7.0	43
Marquette CO	677	984.4	------	35	22	28.8	+9.9	52	18	0	12	0	25	--	--	.78	-.94	.19	11	0	7.4	15	8.9	---	28	S	26	1	5	22	8.5	36
Muskegon	627	988.8	1012.7	39	26	32.8	+8.3	57	19	3	7	0	24	26	75	2.23	+.59	.72	13	2	12.2	6	----	---	--	---	--	4	5	19	7.9	--
Sault Ste. Marie	721	988.8	1012.2	32	17	24.4	+10.9	45	18	-11	12	0	28	21	85	1.55	+.03	.70	15	0	8.5	21	9.3	E	27	W	[a]10	5	4	19	7.6	32
Ypsilanti	722	983.4	1012.8	41	26	33.5	+7.4	65	15	5	12	0	24	26	76	4.31	+2.57	2.08	16	2	12.1	4	11.6	NW	*38	ENE	16	7	4	17	7.1	--
MINNESOTA																																
Duluth	1409	969.9	1012.5	34	13	23.5	+12.5	45	18	-17	12	0	27	18	75	1.03	-.19	.37	7	0	11.8	21	13.2	NW	40	NW	10	10	5	3	5.9	58
Intern'l Falls	1179	967.8	1012.6	33	8	20.4	+13.2	49	18	-27	12	0	28	14	74	1.02	+.15	.50	14	0	12.1	26	10.4	---	--	---	--	9	5	14	6.4	--
Minneapolis	830	979.3	1012.6	40	24	31.8	+13.6	56	18	-2	12	0	25	23	71	.32	-.57	.26	4	0	1.0	1	12.2	NW	35	SE	18	11	4	13	5.6	47
Rochester	1017	974.9	1013.4	40	23	31.8	+13.8	58	14	-4	12	0	25	22	68	.31	-.44	.28	3	0	.2	3	11.9	NW	--	---	--	7	8	13	6.3	--
St. Cloud	1034	973.9	1013.4	37	18	27.2	+13.6	54	18	-11	12	0	27	21	76	.57	-.15	.42	5	0	1.8	9	7.3	WNW	--	---	--	13	3	12	5.1	--
MISSISSIPPI																																
Jackson	315	1004.7	1016.8	68	42	54.9	+3.9	79	27	22	8	0	2	39	59	1.48	-3.61	.58	6	4	.0	0	10.3	SSW	36	W	27	17	8	3	3.4	76
Meridian	294	1003.4	------	69	39	54.1	+3.4	80	27	25	8	0	7	--	--	2.19	-3.19	.95	8	4	.0	0	----	---	--	---	--	18	4	6	3.3	--
Vicksburg CO	234	1007.5	------	67	45	56.3	+4.2	81	27	25	8	0	2	--	--	2.74	-2.40	1.75	6	2	T	0	10.7	---	35	NW	27	16	7	5	3.6	72
MISSOURI																																
Columbia	778	985.4	1014.2	54	32	42.8	+9.1	76	14	15	12	0	14	29	61	1.29	-.28	.77	7	1	2.1	2	12.2	WSW	36	NW	15	6	12	10	5.9	70
Kansas City	741	979.3	1014.9	56	35	45.4	+10.8	76	14	17	12	0	7	29	57	1.75	+.59	.85	4	2	.2	T	11.6	SSW	47	S	14	11	8	9	5.1	68
St. Joseph	809	978.7	1014.5	55	30	42.2	+10.4	75	14	14	7	0	20	28	57	1.72	+.71	1.38	5	2	T	0	12.8	---	34	S	14	12	6	10	5.1	69
St. Louis CO	465	994.2	------	54	35	44.9	+8.2	73	15	17	12	0	8	--	--	.62	-1.26	.42	6	2	T	T	14.1	---	45	SW	14	8	10	10	5.3	69
St. Louis	552	994.2	1014.4	54	34	43.8	+8.1	74	14	16	12	0	13	31	65	.67	-.99	.47	7	2	T	T	11.6	NW	--	---	--	5	9	11	5.6	--
Springfield	1265	966.5	1014.8	55	33	44.0	+7.2	75	14	18	12	0	13	32	67	1.43	-.33	.92	4	2	2.2	2	15.4	S	43	S	[b]19	12	9	7	4.6	67
MONTANA																																
Billings	3568	889.9	1015.6	51	29	40.3	+14.2	68	8	9	11	0	14	23	52	.13	-.31	.06	3	1	.6	2	14.6	WSW	59	NW	24	5	7	16	7.2	58
Glasgow CO	2090	938.7	1015.2	43	20	31.6	+16.9	58	23	-3	11	0	28	23	71	.21	-.13	.11	2	0	1.3	8	----	---	--	---	--	3	5	20	7.9	--
Great Falls	3664	886.2	1014.8	49	31	39.8	+15.2	64	7	9	12	0	14	21	51	.21	-.36	.08	5	1	2.0	1	21.4	SW	72	W	24	4	6	18	7.3	48
Havre CO	2488	924.1	1015.2	48	27	37.1	+18.2	62	[a]7	6	11	0	19	--	--	.15	-.24	.10	3	0	1.5	4	11.7	---	49	W	25	4	5	19	7.5	49
Helena	3893	873.7	1018.9	44	26	34.7	+11.3	57	[b]21	11	11	0	23	23	64	.10	-.31	.07	4	1	.2	3	9.0	W	52	W	24	3	11	14	6.8	63
Kalispell	2965	------	------	33	23	30.4	+5.4	47	[b]17	4	11	0	23	--	--	.75	-.17	.37	10	1	4.8	14	----	---	--	---	--	1	8	19	8.1	--
Miles City	2629	929.9	1015.6	49	25	37.2	+16.1	65	8	8	11	0	27	28	--	.08	-.28	.03	4	0	.3	3	11.2	WNW	--	---	--	5	7	16	6.9	--
Missoula	3200	903.8	1021.5	41	23	31.7	+6.0	51	16	10	[a]4	0	28	25	77	1.05	+.23	.65	11	0	2.1	3	5.7	W	40	NW	24	2	7	19	7.7	38
NEBRASKA																																
Grand Island	1841	947.5	1014.[illegible]	53	28	40.9	+13.2	71	13	17	12	0	24	26	61	.89	+.23	.68	5	0	5.4	5	13.3	N	--	---	--	9	11	8	5.3	--
Lincoln CO	1134	------	------	53	31	42.0	+12.7	71	14	14	7	0	14	--	--	1.86	+.94	1.72	6	1	1.5	2	10.9	---	28	NW	22	--	--	--	---	71
Lincoln	1180	------	------	53	28	40.5	+12.3	70	14	9	7	0	20	24	--	1.48	+.64	1.36	4	1	1.3	1	12.7	N	--	---	--	9	9	10	5.4	--
Norfolk	1544	958.0	1015.1	49	26	37.4	+13.8	68	[a]9	13	12	0	24	26	65	.78	-.01	.62	4	1	7.1	6	----	---	--	---	--	10	9	9	5.2	--
North Platte	2779	914.3	1014.8	57	24	40.3	+11.6	75	8	16	28	0	27	24	58	.01	-.33	.01	1	0	.3	T	12.2	NW	59	N	19	10	10	8	5.1	73
Omaha	978	973.9	1014.7	52	30	40.8	+13.6	68	14	13	[a]7	0	18	27	62	2.59	+1.72	2.24	6	1	1.9	2	13.5	NW	35	S	12	9	9	10	5.4	69
Scottsbluff	3950	878.1	1016.2	58	23	40.5	+12.3	73	8	10	28	0	27	16	42	T	-.41	T	0	0	T	0	13.0	NW	--	---	--	11	8	9	4.9	--
Valentine CO	2581	921.1	------	54	28	40.8	+15.1	72	8	15	11	0	23	--	--	.43	-.03	.21	3	0	T	T	10.0	---	34	NW	19	10	9	9	5.3	81
NEVADA																																
Elko	5075	848.6	1023.3	50	23	36.3	+7.9	62	23	15	[a]3	0	27	24	68	.50	-.45	.35	4	0	1.1	T	5.6	SW	*28	S	17	11	9	8	4.9	--
Ely	6257	812.1	1023.3	49	20	34.3	+6.2	59	9	-1	19	0	27	20	62	.54	-.36	.37	3	0	4.8	2	12.5	---	56	S	12	15	7	6	4.0	83
Las Vegas	2162	953.3	1019.1	69	39	54.1	+3.7	82	26	31	20	0	1	21	30	.02	-.56	.02	2	0	.0	0	8.3	W	*45	SW	18	21	5	2	1.8	93
Reno	4397	866.2	1022.9	56	23	39.9	+3.6	67	[a]9	14	18	0	26	25	63	1.49	+.44	.82	4	0	7.4	3	5.2	S	66	SW	12	15	6	7	3.9	77
Winnemucca	4299	872.3	1022.9	56	20	38.3	+3.8	67	23	9	27	0	25	23	56	.33	-.68	.26	4	0	T	0	8.3	---	40	SW	12	12	5	11	4.9	76
NEW HAMPSHIRE																																
Concord	339	1001.7	1012.9	40	19	29.7	+8.5	59	[b]20	-11	1	0	26	22	76	2.65	+.35	.66	13	0	5.5	5	6.8	NW	34	NW	12	6	6	16	6.7	45
Mt. Washington	6262	795.5	1011.[illegible]	21	5	12.8	+7.3	41	28	-42	12	0	28	--	87	7.30	+2.55	1.94	21	0	35.5	12	35.9	W	†118	NNW	18	8	3	17	7.0	36

See footnotes at end of table.

Table 2—Continued

State and station	Elevation of barometer above sea level[1]	Pressure: Station	Pressure: Sea level	Temperature: Average maximum	Temperature: Average minimum	Temperature: Average	Temperature: Departure from normal	Temperature: Highest	Date	Temperature: Lowest	Date	No. of days: Max. 90° F. or above	No. of days: Min. 32° F. or below	Average dew point	Average relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Greatest in 24 hours	No. of days: .01 inch or more	No. of days: With thunderstorms	Snow, Sleet, Hail: Total	Snow, Sleet, Hail: Max. depth on ground	Wind: Average hourly speed	Wind: Prevailing direction	Fastest mile: Speed	Fastest mile: Direction	Fastest mile: Date	No. of days (sunrise to sunset): Clear	Partly cloudy	Cloudy	Sky cover[7], tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
NEW JERSEY																																
Atlantic City CO	8	1012.2	1014.2	48	34	40.7	+5.3	62	22	13	13	0	13	--	--	1.38	-1.86	0.96	5	0	T	T	16.8	---	47	SE	21	9	12	7	5.0	70
Newark	11	1012.5	1013.8	48	31	39.5	+7.8	74	16	9	13	0	14	28	66	2.07	-1.03	.76	8	0	0.6	1	10.3	NW	*44	S	21	8	9	11	6.1	--
Trenton CO	56	1006.8	1013.5	49	32	40.7	+8.0	72	16	13	13	0	14	--	--	1.48	-1.18	.42	8	0	.1	T	9.6	---	*49	SE	21	8	7	13	5.9	60
NEW MEXICO																																
Albuquerque	5310	850.7	1017.6	61	32	46.8	+7.3	70	13	20	28	0	14	18	35	.07	-.26	.07	2	0	T	T	8.6	SE	49	NW	27	20	7	1	2.2	92
Clayton	4969	844.9	1015.7	60	29	44.3	+7.7	75	13	15	11	0	17	--	--	.09	-.28	.07	2	0	.7	T	----	---	--	---	--	19	6	3	2.9	--
Roswell	3612	894.7	1016.8	69	32	50.3	+5.5	80	24	21	20	0	17	14	28	.00	-.46	.00	0	0	.0	0	11.3	---	61	NW	10	21	5	2	2.3	--
NEW YORK																																
Albany	277	1009.5	1013.2	40	23	31.4	+8.5	55°	28	-9	13	0	24	23	73	2.62	+.59	1.32	12	0	7.7	3	9.3	WNW	37	W	12	3	8	17	7.5	38
Binghamton	1601	951.9	1012.5	38	23	30.7	+9.1	66	16	-3°	13	0	24	23	75	2.05	-.25	1.11	17	0	12.4	3	12.5	WNW	38	NW	11	3	5	20	8.3	39
Buffalo	693	984.8	1013.2	40	26	33.1	+8.4	64	28	1	12	0	23	25	74	3.72	+1.13	2.31	13	0	12.6	5	15.3	SW	52	SW	8	2	2	24	8.6	33
New York CO	10	1001.7	------	48	33	40.2	+7.5	68°	16	11	13	0	11	--	--	1.63	-1.50	.62	7	1	T	T	14.6	---	57	NW	12	8	7	13	6.0	53
New York	19	1012.2	1014.0	48	32	40.2	+7.6	70	15	12°	13	0	11	28	62	1.89	-1.15	.74	6	0	.2	T	12.2	NW	49	NW	12	7	9	12	6.4	--
Rochester	543	993.2	1013.2	39	25	32.1	+8.1	63	28	3	12	0	23	26	80	2.47	+.05	1.13	10	0	11.2	5	12.2	W	37	S	21	1	6	21	8.2	32
Schenectady	217	------	------	40	25	32.3	+10.4	56	28	-4	13	0	19	--	--	2.68	+.46	1.49	10	0	7.3	4	----	---	--	---	--	12	9	7	5.0	--
Syracuse	424	991.2	1013.8	41	25	33.0	+7.9	66	28	-3°	13	0	24	25	75	3.74	+1.22	1.92	18	0	19.2	6	9.2	WNW	40	NW	11	2	7	19	8.2	39
NORTH CAROLINA																																
Asheville CO	2203	------	------	54	33	43.9	+3.1	72	15	19	8	0	13	--	--	3.64	+.79	1.81	7	5	3.5	3	10.4	---	38	N	28	12	8	8	4.8	64
Asheville	2093	941.1	1016.2	--	--	----	----	--	--	--	--	--	--	32	73	----	-----	----	--	--	----	--	6.5	NNW	--	---	--	--	--	--	---	--
Charlotte	753	987.5	1015.8	60	36	48.3	+3.9	74	28	22	13	0	10	34	63	2.47	-1.08	1.05	6	4	.0	0	7.5	S	33	S	28	11	9	8	5.1	69
Greensboro	891	984.1	1016.6	57	33	45.4	+4.4	73	15	18°	13	0	15	32	64	2.21	-.92	1.08	7	2	.3	0	8.7	SW	30	W	16	10	9	9	5.3	63
Hatteras	4	1015.6	1016.4	57	45	50.7	+3.1	73	28	31	13	0	2	42	75	2.68	-1.33	1.72	6	3	.0	0	12.5	SSW	37	N	12	11	9	8	5.2	53
Raleigh CO	400	------	------	60	37	48.2	+3.8	75	28	21	13	0	9	--	--	3.70	+.20	3.30	8	1	.0	0	6.9	---	29	SE	28	10	9	9	4.8	66
Raleigh	438	1000.0	1016.2	59	35	47.2	+4.1	75	28	20	12	0	13	33	63	1.70	-1.85	1.13	6	2	.0	0	8.6	SW	--	---	--	9	11	8	5.3	--
Wilmington	30	1015.2	1016.6	63	41	52.1	+3.4	76	16	26	13	0	5	--	--	1.54	-1.76	.77	6	1	T	0	10.6	---	45	SW	21	14	5	9	4.4	66
Winston-Salem	967	979.7	1015.6	57	36	46.4	+5.2	72	15	18	13	0	10	30	56	2.33	-1.06	1.58	6	1	T	0	9.5	SW	*26	SSE	28	10	9	9	5.1	--
NORTH DAKOTA																																
Bismarck	1650	952.3	1014.0	44	24	33.9	+21.2	62	18	-1	11	0	27	25	75	.12	-.31	.05	3	0	.3	3	10.3	WNW	49	NW	22	5	8	15	6.6	61
Devils Lake CO	1471	958.3	------	34	18	25.8	+17.1	47	17	-13	11	0	28	--	--	.26	-.15	.10	5	0	1.8	15	9.0	---	26	NW	26	6	8	14	6.4	57
Fargo	895	978.0	1013.7	34	19	26.5	+15.7	43°	18	-8°	11	0	28	22	81	.03	-.63	.01	3	0	.3	11	15.5	SSE	39	SE	22	8	6	14	6.0	64
Williston CO	1877	944.5	1013.0	41	24	32.8	+19.3	56	17	-3	11	0	25	26	76	.27	-.19	.15	3	0	.9	9	7.3	---	26	NW	22	4	7	17	7.4	57
OHIO																																
Akron	1210	975.3	1014.2	43	25	33.6	+5.6	66	15	2	12	0	23	26	75	2.07	-.06	.39	14	0	8.7	5	11.1	NW	--	---	--	3	4	21	8.0	--
Cincinnati Obs.	761	------	------	52	33	42.7	+7.9	71	15	17°	12	0	14	--	--	1.96	-.59	.81	11	3	2.5	1	8.2	---	32	SW	20	--	--	--	---	46
Cincinnati	869	981.7	1014.2	51	32	41.5	+7.6	70	15	15	7	0	15	28	63	1.84	-.71	.92	8	4	2.0	1	11.9	SSW	*45	SSW	20	7	5	16	6.5	--
Cleveland CO	663	------	------	44	30	36.8	+6.7	66	15	12	12	0	21	--	--	2.60	+.41	.66	13	--	----	--	----	---	--	---	--	--	--	--	---	--
Cleveland	787	985.1	1013.4	44	28	36.3	+7.7	67	15	10	12	0	21	27	72	2.88	+.76	.48	16	1	14.7	4	12.5	SW	41	SE	20	4	3	21	8.0	31
Columbus CO	724	------	------	49	34	41.6	+9.0	70	15	15	12	0	11	--	--	1.71	-.44	.75	7	--	5.5	3	----	---	--	---	--	--	--	--	---	--
Columbus	815	983.4	1014.3	48	30	39.0	+7.8	70	15	11	12	0	18	29	69	1.78	-.49	.75	8	1	5.7	3	10.6	NW	40	SW	16	5	6	17	7.3	48
Dayton	1002	970.5	1013.7	48	30	38.7	+7.3	69	15	11°	12	0	18	29	71	2.07	-.04	.88	10	2	4.3	2	11.7	NW	51	SW	20	8	4	16	4.3	52
Portsmouth CO	715	------	------	55	33	44.0	+9.1	79	15	19	12	0	16	--	--	1.25	-1.41	.35	11	2	7.7	4	8.8	---	56	SW	26	--	--	--	---	--
Sandusky CO	603	990.5	------	44	30	37.1	+7.7	69	15	11	12	0	16	--	--	2.89	+.97	1.22	14	2	8.1	3	9.1	---	31	SW	15	6	7	15	6.4	47
Toledo	622	989.2	1013.1	43	27	35.4	+8.1	70	15	7	12	0	22	27	75	2.89	+1.03	1.24	12	3	8.6	3	13.3	SW	38	SW	20	4	6	18	7.5	36
Youngstown	1178	970.2	1013.9	42	25	33.5	+5.3	65	15	7	12	0	22	25	72	2.61	-.11	.72	15	0	7.7	4	11.5	SW	*29	SSE	20	3	4	21	8.3	--
OKLAHOMA																																
Oklahoma City	1280	971.9	1017.5	65	37	51.3	+9.5	81°	14	21	7	0	7	30	47	.69	-.55	.68	2	1	T	0	17.4	N	56	NW	19	16	10	2	3.1	85
Tulsa	672	990.2	1015.0	64	38	50.9	+8.9	79	9	24	7	0	7	31	50	.87	-.70	.82	2	2	T	0	13.6	NNW	38	SW	14	16	8	4	3.4	80
OREGON																																
Astoria	12	1018.3	1019.4	53	38	45.1	+2.0	65	6	28	10	0	5	40	87	9.56	+1.84	2.08	15	0	T	T	8.0	S	--	---	--	3	5	20	7.9	--
Burns CO	4140	876.4	1022.4	48	26	36.6	+5.4	64	23	21°	4	0	26	26	69	.25	-.98	.24	2	0	T	T	----	---	--	---	--	6	3	19	7.1	--
Eugene	361	1006.8	1020.8	52	35	43.2	+.5	61	25	27	27	0	13	38	83	3.65	-1.19	1.19	10	0	T	0	7.3	S	*45	S	12	2	7	19	7.9	--
Meacham	4050	------	------	44	29	36.5	+7.5	59	23	22°	10	0	23	--	--	1.39	-2.96	.49	9	0	8.3	9	----	---	--	---	--	6	7	15	6.7	--
Medford	1312	971.2	1021.7	57	32	44.4	+1.8	67	7	24	6	0	18	36	78	1.69	-.33	.83	6	0	.0	0	2.7	S	*30	S	12	7	8	13	6.4	--
Pendleton	1489	966.5	1021.6	45	33	39.0	+2.4	65	23	24	11	0	13	29	71	.48	-.92	.22	8	0	T	T	8.4	S	--	---	--	1	5	22	8.7	--
Portland	22	1014.6	1020.2	50	35	42.6	+1.1	60	23	25	8	0	9	37	80	4.57	+.42	1.67	14	0	.0	0	10.5	ESE	44	S	12	4	5	19	7.6	45
Roseburg	505	1002.0	1021.4	57	35	45.7	----	65	25	27	27	0	9	--	--	3.22	-.54	1.30	11	0	T	0	4.8	---	24	S	17	0	9	19	8.0	37
Salem	195	1012.9	1020.4	52	34	42.9	+.1	64	23	25	7	0	14	37	80	5.87	+.55	1.75	14	1	.0	0	7.8	S	--	---	--	5	4	19	7.4	--
Sexton Summit CO	3836	------	------	49	37	43.1	+6.7	64	7	23	18	0	9	--	--	3.47	-.12	1.90	9	1	10.9	11	----	---	--	---	--	9	3	16	6.2	--
PENNSYLVANIA																																
Allentown	376	999.7	1014.3	47	27	36.8	+8.2	72	16	8	13	0	21	27	70	1.63	-1.01	.50	6	0	4.2	4	10.9	NW	--	---	--	5	8	15	6.4	--
Harrisburg	335	1000.3	1014.7	48	31	39.4	+7.3	75	16	11	13	0	19	24	59	2.18	-.06	.91	8	0	1.3	1	9.4	WNW	43	SE	21	5	11	12	6.5	46
Park Place CO	1932	------	------	39	23	30.9	+6.7	67	17	1	13	0	25	--	--	3.31	+.79	1.18	8	0	8.0	6	----	---	--	---	--	4	7	17	7.0	--
Philadelphia CO	26	------	------	51	34	42.4	+7.3	72	16	14	13	0	10	--	--	1.57	-1.46	.65	6	0	T	0	8.4	---	37	SE	21	8	8	12	6.0	63
Philadelphia	13	1009.8	1014.3	50	32	41.2	+7.6	73	16	11	13	0	15	27	60	1.37	-1.65	.58	7	0	.2	T	10.3	WSW	*40	SSE	21	9	5	14	6.0	--
Pittsburgh CO	749	------	------	48	32	40.4	+6.8	70°	16	13	12	0	17	--	--	1.74	-.61	.96	11	--	2.8	--	----	---	--	---	--	--	--	--	---	28
Pittsburgh	1151	983.4	1014.0	45	29	37.1	+7.3	69	15	8	12	0	21	26	66	1.55	-.82	.39	16	[illegible]	4.7	2	12.2	WSW	*34	ESE	21	2	4	22	8.2	39
Reading CO	266	1001.7	1013.9	49	32	40.3	+7.5	74	15	13	13	0	17	--	--	1.39	-1.29	.43	7	0	3.8	4	12.1	---	47	S	17	5	7	16	7.0	42
Scranton CO	746	983.4	1013.2	45	23	36.5	+8.2	74	16	7°	13	0	19	--	--	2.11	+.09	1.23	9	0	1.2	1	6.6	---	30	NW	11	6	6	16	7.1	41
Williamsport	527	994.6	1013.9	45	27	36.1	+7.0	71	16	2	13	0	21	24	66	3.57	+1.23	1.40	8	0	3.4	4	8.1	W	*42	WNW	12	4	4	20	7.6	--
RHODE ISLAND																																
Block Island	110	1008.5	1013.2	43	30	36.9	+6.0	53	21	4	13	0	17	--	--	2.65	-.60	1.10	6	1	.1	T	----	---	--	---	--	4	7	17	7.0	--
Providence	55	1006.8	1013.1	44	27	35.4	+6.8	59	16	-1	13	0	20	25	69	2.68	-.16	.79	8	1	.2	T	11.8	NNW	*30	NNW	12	7	8	13	6.7	51
SOUTH CAROLINA																																
Charleston CO	9	1014.2	------	64	47	55.7	+3.0	74°	21	37°	13	0	0	--	--	.42	-2.65	.17	5	1	T	0	10.1	---	30	SE	28	14	8	6	4.0	75
Charleston	41	1014.6	1016.5	67	42	54.3	+2.4	77	10	25	1	0	3	42	69	.56	-2.57	.18	7	1	T	0	10.4	SW	--	---	--	13	4	11	4.7	--
Columbia CO	332	1003.1	------	64	42	53.4	+4.0	77	10	29	13	0	2	--	--	1.40	-1.93	1.40	6	0	.0	0	----	---	--	---	--	13	9	6	4.2	--
Columbia	217	1007.8	1016.1	66	39	52.3	+3.8	79	10	23	1	0	7	39	66	2.26	-1.37	1.51	5	3	.0	0	8.0	SW	--	---	--	13	8	7	4.3	83
Florence	146	1010.5	1015.9	66	40	52.7	+5.1	79	28	24	13	0	5	--	--	1.31	-1.99	1.04	4	1	.0	0	----	---	--	---	--	11	8	9	5.0	--
Greenville	1018	977.7	1015.4	60	38	49.0	+3.7	73	10	26	13	0	7	33	61	2.14	-2.12	1.08	[illegible]	3	T	0	10.4	SW	40	W	16	16	9	3	4.6	72
Spartanburg	801	------	------	60	37	48.4	+3.0	73	10	25	13	0	8	--	--	2.30	-1.93	1.18	6	2	.0	0	----	---	--	---	--	14	6	8	4.2	--
SOUTH DAKOTA																																
Huron	1282	965.8	1014.2	45	26	35.6	+18.0	58°	8	9	11	0	28	28	77	.28	-.21	.15	4	0	1.2	2	11.6	NW	37	NW	22	9	8	11	6.0	60
Rapid City	3165	899.4	1014.9	55	27	41.2	+17.3	74	8	10	11	0	21	22	50	.34	+.02	.12	7	0	1.3	1	12.0	NW	52	W	22	4	14	10	6.3	59
Sioux Falls	1420	961.4	1014.3	43	24	33.4	+13.9	66	14	7	11	0	27	24	70	1.88	+1.14	1.05	4	1	9.2	5	11.8	NW	*30	NNE	19	9	10	9	5.5	--
TENNESSEE																																
Bristol	1519	960.4	------	56	31	43.5	+3.4	76	15	16	8	0	18	--	--	2.11	-1.30	1.87	9	0	5.9	6	----	---	--	---	--	6	11	11	6.2	--
Chattanooga	670	988.5	1016.4	61	35	48.2	+4.2	74	10	20	8	0	9	35	64	3.58	-1.53	1.38	7	3	T	0	7.8	S	49	NW	16	12	8	8	4.[illegible]	71
Knoxville	950	980.4	1016.2	59	35	47.0	+4.5	73°	27	20	8	0	9	33	62	3.14	-1.59	1.71	8	1	4.9	5	9.7	WSW	40	SW	15	9	9	10	5.7	55
Memphis CO	271	------	------	61	41	50.7	+6.2	78	27	26	8	0	3	--	--	4.85	+.63	2.50	4	--	T	T	----	---	--	---	--	--	--	--	---	--
Memphis	263	1001.0	1015.9	62	39	50.8	+6.3	79	27	24	8	0	5	36	59	4.97	+.38	2.92	4	3	T	T	10.6	S	42	S	27	14	6	8	4.2	69
Nashville	577	995.6	1015.8	59	35	47.3	+5.0	75	27	20	8	0	11	35	66	4.00	-.16	1.80	6	3	T	0	11.3	NW	38	W	27	10	10	8	5.1	64

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	# Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M p. h.		M. p. h			0–3	4–7	8–10	0–10	%
TENNESSEE (Cont.)																																
Oak Ridge CO	905	982.1	------	58	34	46.0	+5.6	71	15	19	8	0	13	--	--	4.64	-1.15	2.94	6	2	1.1	T	5.4	---	24	NW	26	7	9	12	6.0	--
TEXAS																																
Abilene	1759	955.0	1016.6	70	41	55.9	+7.8	87	26	28	12	0	3	28	39	.13	-.78	.08	2	1	.0	0	14.4	N	55	W	19	20	7	1	2.1	91
Amarillo	3590	899.3	1015.8	64	33	48.6	+9.0	79	14	20	28	0	14	20	37	.09	-.53	.07	2	0	.2	T	14.1	SW	57	N	19	17	7	4	3.0	82
Austin	615	995.9	1018.1	74	45	59.5	+5.4	93	26	32	8	2	1	39	52	.28	-2.28	.20	5	0	.0	0	10.9	N	45	N	27	16	7	5	3.5	73
Brownsville	16	1015.2	1017.6	78	56	66.9	+2.9	94	27	37	8	1	0	55	71	T	-1.20	T	0	0	.0	0	13.0	SSE	*37	NNE	28	12	9	7	4.7	72
Corpus Christi	40	1017.3	1018.4	78	52	64.9	+5.5	96	27	32	8	1	1	49	64	.01	-1.43	.01	1	0	.0	0	12.8	SSE	38	N	27	13	7	8	4.4	77
Dallas	487	998.3	1017.1	70	43	56.9	+7.1	88	26	30	°7	0	3	39	56	.70	-1.92	.38	4	2	.0	0	12.8	S	43	SW	19	20	5	3	2.3	83
Del Rio	1091	983.4	1018.0	76	46	61.0	+3.9	93	26	34	8	1	0	33	40	.01	-1.06	.01	1	0	.0	0	6.7	NW	42	NW	19	16	4	8	3.8	76
El Paso	3920	888.6	1017.8	68	38	52.6	+3.5	77	25	28	°16	0	9	20	29	T	-.36	T	0	0	.0	0	12.4	NNE	66	NW	18	20	5	3	2.7	93
Fort Worth	544	996.3	1017.2	70	42	56.3	+6.5	88	26	28	8	0	3	34	48	.73	-1.84	.60	4	1	.0	0	13.9	S	*38	W	19	19	7	2	2.7	--
Galveston CO	7	------	------	67	55	60.9	+3.5	76	27	43	8	0	0	--	--	.09	-2.79	.08	2	--	.0	0	13.1	---	42	N	27	--	--	--	---	76
Galveston	5	1015.9	1018.3	68	53	60.5	+3.2	77	27	40	8	0	0	50	72	.18	-2.96	.11	4	1	.0	0	13.4	SW	--	---	--	15	5	8	3.9	--
Houston CO	41	1012.5	------	72	52	61.7	+4.0	86	27	38	8	0	0	--	--	.17	-2.64	.08	3	0	.0	0	11.1	---	34	N	27	18	5	5	3.2	77
Bouston	50	1015.2	1018.3	72	49	60.6	+4.0	87	27	32	8	0	1	44	61	.09	-2.61	.09	1	0	.0	0	14.1	NNW	--	---	--	15	6	7	3.9	--
Laredo	500	1002.0	1017.5	80	54	66.9	+5.0	96	26	39	8	4	0	43	47	T	-.85	T	0	0	.0	0	11.7	SE	*32	NNE	27	14	8	6	4.3	--
Lubbock	3243	903.8	1016.5	67	31	49.0	+5.9	81	14	20	12	0	21	23	40	T	-.53	T	0	0	T	0	15.7	W	*56	NNW	19	17	9	2	2.8	--
Midland	2854	917.4	1017.2	69	39	53.8	----	82	26	30	28	0	3	22	35	.12	----	.12	1	1	.0	0	7.8	SW	*45	NNE	6	19	4	5	2.9	--
Port Arthur	16	1016.3	1017.9	71	48	59.3	+3.3	79	27	30	8	0	1	48	72	.36	-3.83	.34	2	1	.0	0	13.5	SW	45	SW	25	14	7	7	4.0	70
San Angelo	1903	949.9	1017.6	71	42	56.4	+4.7	86	26	30	12	0	3	29	38	.04	-.95	.04	1	0	.0	0	----	---	--	---	--	21	6	1	2.2	--
San Antonio	792	992.6	1017.8	75	45	60.4	+5.3	91	26	29	8	1	1	35	45	.03	-1.55	.02	2	0	.0	0	8.8	NNW	56	N	27	14	9	5	3.8	75
Victoria	110	1013.2	1017.9	75	49	62.2	+3.3	91	27	32	8	1	1	44	55	.20	-1.77	.10	3	0	.0	0	11.2	---	†52	N	27	13	8	7	4.0	--
Waco	500	998.3	1017.2	72	42	56.7	+5.0	90	26	25	8	1	1	39	55	.44	-2.19	.34	2	1	.0	0	12.6	S	--	---	--	18	8	2	2.7	--
Wichita Falls	1027	979.3	1016.1	70	39	54.6	+8.8	85	26	24	7	0	6	29	42	.20	-1.29	.20	1	1	.0	0	12.4	NW	*50	N	19	22	4	2	2.0	--
UTAH																																
Milford	5028	851.3	1024.6	49	22	35.4	+4.5	66	°24	9	19	0	27	--	--	.20	-.51	.17	3	0	2.9	2	----	---	--	---	--	4	18	6	5.5	--
Salt Lake City	4222	876.4	1024.9	45	28	36.4	+3.0	61	24	11	19	0	22	25	69	.81	-.42	.75	3	0	5.6	5	9.3	SE	56	SE	18	4	5	19	7.6	40
VERMONT																																
Hurlington	331	998.0	1013.1	36	19	27.1	+9.0	54	28	-22	13	0	26	20	76	3.98	+2.45	1.64	15	0	29.9	15	9.7	S	37	S	14	6	2	20	7.6	45
VIRGINIA																																
Lynchburg	947	980.7	1015.3	54	33	43.8	+4.6	73	15	16	8	0	12	28	57	1.54	-.94	.74	5	1	T	T	9.6	SSW	34	E	21	9	9	10	5.7	65
Norfolk	26	1014.9	1016.0	56	37	46.7	+4.7	75	°28	23	8	0	9	34	64	1.59	-1.47	1.30	6	0	.0	0	10.0	SW	30	W	17	10	9	9	5.0	74
Richmond	162	1009.5	1015.9	57	33	44.9	+5.2	76	15	14	13	0	14	31	61	1.56	-1.20	1.34	3	0	.0	0	8.9	S	29	SE	28	12	5	11	5.3	60
Roanoke	1174	972.6	1015.4	54	33	43.8	+4.6	76	15	17	8	0	14	26	54	3.83	+1.27	2.54	6	0	1.3	T	10.5	NW	--	---	--	8	10	10	5.8	--
WASHINGTON																																
Olympia	190	1011.2	1018.5	50	33	41.7	+1.7	63	7	25	°10	0	12	36	81	8.40	+2.24	1.77	16	0	.6	T	8.5	SSW	*32	SSW	19	3	3	22	8.2	--
Seattle CO	14	------	------	51	40	45.1	+1.6	64	7	33	°3	0	0	--	--	5.31	+1.57	1.53	16	0	T	0	12.4	---	64	S	19	3	2	23	8.5	22
Seattle	14	1017.3	1018.4	--	--	----	----	--	--	--	--	--	--	38	79	----	-----	----	--	--	---	---	9.1	SSE	--	---	--	--	--	--	---	--
Seattle-Tacoma	379	1004.1	1018.4	49	36	42.2	+1.3	58	°3	28	°3	0	7	37	84	4.38	+.43	1.38	15	0	T	0	11.7	SW	--	---	--	4	1	23	8.3	--
Spokane	2357	949.5	1020.2	39	27	33.1	+3.4	55	23	5	11	0	20	27	78	1.19	-.27	.70	7	0	3.9	11	9.8	SW	40	SW	19	4	4	20	8.3	42
Tatoosh CO	101	1012.5	1016.4	48	40	44.0	+.8	55	6	33	18	0	0	40	85	10.47	+1.77	1.94	20	1	T	0	22.1	E	61	SW	19	1	1	26	9.1	15
Walla Walla CO	949	984.8	1021.7	46	36	41.1	+2.8	65	23	26	°10	0	12	--	--	.60	-.93	.21	10	0	.1	T	7.0	---	34	SW	25	1	6	21	8.6	18
Walla Walla	1200	------	------	--	--	----	----	--	--	--	--	--	--	31	--	-----	-----	----	--	--	---	--	8.7	S	--	---	--	--	--	--	---	--
Yakima	1061	981.4	1021.1	44	28	35.8	+1.6	62	23	16	10	0	22	28	76	.49	-.32	.34	5	0	3.0	10	8.4	W	--	---	--	2	4	22	8.5	--
WEST VIRGINIA																																
Charleston	950	979.0	1014.8	54	33	43.5	+5.3	73	15	17	13	0	16	30	61	2.17	-1.33	1.72	12	1	2.1	1	10.4	WSW	*30	SSE	26	6	6	16	6.9	--
Elkins	1970	944.8	1015.4	48	25	36.3	+3.8	70	16	0	8	0	23	27	--	1.91	-1.14	.54	17	1	8.0	3	6.7	NW	33	W	2	4	5	19	7.7	39
Huntington	565	------	------	56	33	44.5	+5.5	76	15	18	7	0	15	--	--	1.28	-1.78	.71	9	--	2.4	1	----	---	--	---	--	--	--	--	---	--
Parkersburg CO	615	------	------	53	32	42.5	+7.0	75	15	16	12	0	17	--	--	1.41	-1.24	.62	10	1	2.0	1	7.0	---	29	NW	26	6	7	15	6.9	42
Parkersburg	837	------	1014.3	--	--	----	----	--	--	--	--	--	--	29	--	----	-----	----	--	--	---	--	9.3	SW	--	---	--	--	--	--	---	--
Petersburg	1013	------	------	52	30	41.0	+5.3	77	16	11	13	0	20	--	--	.79	-1.10	.29	7	--	T	0	----	---	--	---	--	9	6	13	5.9	--
WISCONSIN																																
Green Bay	689	989.2	1012.8	36	19	27.6	+10.3	50	18	-6	12	0	26	21	72	.98	-.38	.28	10	0	7.2	5	7.9	NW	33	SW	26	6	8	14	6.8	59
La Crosse	652	987.8	1013.0	41	24	32.8	+13.5	56	°14	-1	12	0	23	24	70	.19	-.92	.14	3	0	.5	5	9.2	NW	*23	NW	11	5	8	15	6.9	--
Madison	857	976.0	1012.9	41	24	32.9	+11.0	58	15	0	12	0	24	24	70	.63	-.50	.40	8	0	2.1	4	11.2	NNW	35	SW	26	4	8	16	7.1	59
Milwaukee	675	987.5	1013.1	40	26	33.1	+8.9	60	15	4	12	0	22	24	71	1.31	+.04	.48	10	1	4.9	4	12.9	NNW	40	SW	7	4	6	18	7.3	51
WYOMING																																
Casper	5322	836.4	1016.3	49	25	37.3	+11.4	60	8	3	27	0	22	20	52	.37	-.35	.19	4	0	6.6	3	18.4	SSW	--	---	--	10	8	10	5.4	--
Cheyenne	6139	810.4	1016.1	53	25	38.9	+11.2	67	8	8	27	0	25	16	42	.08	-.57	.07	2	0	1.0	1	18.5	WNW	56	W	20	15	5	8	4.5	80
Lander	5563	835.1	1018.6	50	23	36.4	+13.5	63	23	10	27	0	26	21	57	.13	-.48	.05	3	0	1.3	1	8.2	---	50	SW	13	7	10	11	5.4	75
Rock Springs	6741	795.5	1022.7	43	21	32.4	+9.6	56	12	8	27	0	28	27	--	.17	-.43	.13	2	0	1.5	1	17.2	W	*52	WNW	21	9	8	11	5.5	--
Sheridan	3942	882.8	1016.6	53	24	36.7	+15.5	69	8	11	11	0	28	24	61	1.24	+.63	.96	8	0	11.8	4	9.8	NW	52	N	24	6	7	15	6.6	58
PACIFIC AREA																																
Canton Island	9	1008.8	1009.1	88	77	82.7	-.3	92	°18	73	10	10	0	73	76	.20	-.34	.18	4	0	.0	0	----	---	---	---	--	6	11	11	6.1	--
Hilo	28	1013.5	1014.9	79	62	70.6	-.1	86	9	56	°7	0	0	62	78	15.87	+6.39	8.08	14	1	.0	0	6.9	SW	*26	ESE	27	5	14	9	6.1	61
Honolulu	7	1015.2	1015.9	80	66	73.0	+.6	82	°7	58	8	0	0	63	74	3.98	+1.46	1.40	10	2	.0	0	9.3	ENE	43	W	26	8	10	10	5.8	65
Koror CO	94	1006.8	1010.5	88	75	81.6	+1.2	92	27	73	°4	6	0	--	--	3.04	-4.97	1.15	14	0	.0	0	----	---	---	---	--	0	7	21	8.3	--
Lihue	115	1009.6	1014.9	78	64	71.0	+.9	80	°1	54	6	0	0	64	82	8.75	+4.31	7.28	16	3	.0	0	9.4	ENE	32	N	22	9	6	13	6.0	34
Ponape CO	112	1006.4	1011.6	85	76	80.7	-1.2	89	12	73	°10	0	0	--	-	8.44	+.57	1.65	16	0	.0	0	----	---	---	---	--	--	--	--	---	--
Truk (Moen Island)	3	1010.5	1010.8	85	76	60.6	-.4	87	°4	72	9	0	0	--	--	10.52	+3.42	2.05	19	0	.0	0	----	---	---	---	--	1	4	23	8.9	--
Wake Island	11	1014.9	1015.2	81	72	76.5	-.8	85	1	65	12	0	0	67	72	2.96	+1.45	1.44	15	0	.0	0	14.8	ENE	---	---	--	10	13	5	5.2	--
Yap CO	53	1009.1	1011.1	87	76	81.5	+.8	91	6	72	4	1	0	74	80	1.93	-3.00	1.78	9	0	.0	0	----	---	---	---	--	0	7	21	8.8	--
WEST INDIES																																
San Juan CO	47	------	------	81	69	74.7	-.2	85	°28	66	20	0	0	--	--	8.13	+5.46	2.32	17	--	.0	0	----	---	--	--	--	--	--	--	---	--
San Juan, P. R.	9	1014.2	1016.1	82	69	75.5	+.8	86	°8	67	°20	0	0	68	81	7.34	+4.11	1.77	17	0	.0	0	8.6	SSE	27	E	17	12	10	6	5.6	67
																							p. h.		p. h.			3	7	10		
ALASKA																																
Anchorage	92	1001.0	1006.3	18	-5	6.7	-11.9	41	5	-25	27	0	28	-5	58	.18	-.40	.16	3	0	2.5	12	5.3	NNE	*27	S	2	13	2	3	5.0	65
Annette Island	110	1003.7	1007.7	38	29	33.6	-2.5	52	°4	10	14	0	16	16	77	13.88	+6.84	3.25	19	0	11.8	5	16.4	SSE	*50	SSE	°1	4	2	22	8.3	--
Barrow	22	1013.2	1014.0	-17	-30	-23.5	-5.6	0	10	-48	24	0	28	-32	61	.20	+.05	.07	10	0	2.2	16	11.5	---	31	W	°25	9	4	15	5.9	--
Bethel	21	1008.8	1010.3	0	-18	-9.0	-18.1	28	10	-39	°2	0	28	-15	72	.32	-.50	.15	6	0	5.5	18	11.8	NNE	*36	NNE	24	14	4	10	4.4	--
Cordova	40	1001.4	1003.0	30	10	20.1	-6.0	43	°4	-12	28	0	28	12	73	7.11	+1.84	3.42	14	0	27.9	19	3.6	E	*23	E	5	8	4	16	6.4	--
Fairbanks	436	994.6	1013.4	-3	-31	-16.9	-13.8	39	5	-50	26	0	28	-29	53	.21	-.30	.12	4	0	4.5	19	2.2	N	25	W	9	13	5	10	4.9	--
Juneau	15	1006.8	1007.7	29	18	23.6	-3.7	48	5	-5	13	0	24	15	70	4.22	+.87	1.02	16	0	13.8	9	10.5	ESE	50	SE	3	6	2	20	7.5	43
Kotzebue	10	1015.6	1016.1	-7	-23	-14.8	-10.1	18	11	-43	3	0	28	-23	69	.13	-.19	.05	6	0	2.9	12	12.2	W	*35	SW	8	12	6	10	4.9	--
McGrath	334	998.6	1012.5	-1	-28	-14.5	-14.9	21	°6	-50	25	0	28	-21	77	.28	-.87	.11	6	0	3.3	20	1.9	N	*16	SW	8	17	0	11	3.9	--
Nome	13	1013.9	1014.5	2	-19	-8.8	-14.5	25	10	-36	27	0	28	-16	69	.15	-.78	.11	3	0	2.2	15	6.1	ENE	34	W	8	17	0	11	3.9	66
Northway	1713	945.1	1013.0	-7	-34	-20.6	-11.2	27	6	-57	18	0	28	-28	74	.15	-.19	.07	4	0	2.5	11	4.2	NW	*28	NW	25	14	2	12	5.0	--
St. Paul Island	22	1007.8	1009.0	13	4	8.3	-15.5	34	°10	-12	25	0	28	4	78	.43	-.70	.39	4	0	4.3	8	----	---	--	---	--	9	9	10	5.8	--
Yakutat	28	1003.4	1004.4	32	14	23.0	-5.0	48	5	-8	17	0	26	15	73	6.25	-2.36	2.01	16	0	12.1	13	9.9	ESE	*37	SSE	5	6	4	18	7.1	--

Data from airport unless otherwise specified. CO indicates data from city office.

* Data entered in column "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.

° Other dates also.

† Peak gust.

Max. 70°F. or above for Alaskan Stations.

HEATING DEGREE DAYS

(Base 65°F.)

Table 3

FEBRUARY 1954

State and station	Current season		Normals
	This month	Period July through this month	July through this month
ALABAMA			
Birmingham	381	2105	2244
Mobile	213	1271	1343
Montgomery (CO)	271	1543	1623
Montgomery	296	1689	1769
ARIZONA			
Flagstaff	846	4837	5212
Phoenix (CO)	84	948	1255
Phoenix	114	1148	1428
Prescott	536	3003	3358
Tucson	127	1160	1453
Winslow	610	3455	3610
Yuma	40	656	849
ARKANSAS			
Ft. Smith	419	2550	2619
Little Rock	372	2286	2441
Texarkana	284	1919	1954
CALIFORNIA			
Bakersfield	353	1738	1730
Bishop	515	2991	3179
Blue Canyon	508	3341	3708
Burbank	128	936	1284
Eureka (CO)	460	2859	3050
Fresno	422	1988	2040
Los Angeles (CO)	98	693	1023
Los Angeles	144	967	1380
Mt. Shasta (CO)	664	3680	4111
Oakland	367	1909	2190
Red Bluff	368	1854	1982
Sacramento (CO)	421	1830	1997
Sacramento	449	2014	2142
Sandberg (CO)	428	2707	2862
San Diego	124	753	1060
San Francisco (CO)	302	1861	2045
San Francisco	383	2048	2288
San Jose	325	1540	1690
Santa Maria	224	1729	1936
COLORADO			
Alamosa	904	5875	6288
Colorado Springs	663	3857	4443
Denver	589	3531	4413
Grand Junction	674	3819	4488
Pueblo	584	3432	4248
CONNECTICUT			
Bridgeport	775	3588	4177
Hartford	803	3950	4508
New Haven	785	3824	4281
DELAWARE			
Wilmington	684	3391	3700
DIST. OF COLUMBIA			
Washington (CO)	583	2833	3258
Washington	595	2898	3304
FLORIDA			
Apalachicola (CO)	176	954	1090
Daytona Beach	126	539	720
Fort Myers	60	261	345
Jacksonville (CO)	133	800	945
Jacksonville	161	897	1051
Key West (CO)	0	29	70
Miami (CO)	20	115	158
Int. Airport, Hialeah	16	104	166
Miami Beach	6	57	114
Orlando	109	465	558
Pensacola (CO)	197	1100	1187
Tallahassee	226	1143	1278
Tampa	93	389	572
West Palm Beach	54	167	215
GEORGIA			
Albany	244	1350	1487
Athens	416	2154	2253
Atlanta (CO)	405	2115	2260
Atlanta	409	2133	2269
Augusta	354	1898	1768
Columbus	352	1817	1951
Macon	299	1657	1712
Rome	480	2503	2516
Savannah	268	1392	1429
Valdosta	220	1157	1277
IDAHO			
Boise	727	3691	4377
Lewiston	660	3525	4122
Pocatello	828	4263	5082
ILLINOIS			
Cairo (CO)	495	2760	3004
Chicago (CO)	751	3673	
Chicago	761	3814	4648
Chicago University	747	3732	
Moline	796	4180	4805
Peoria	766	3917	4591
Springfield (CO)	656	3395	4021
Springfield	715	3671	4317
INDIANA			
Evansville	571	3216	3424
Ft. Wayne	796	3973	4618
Indianapolis (CO)	659	3417	3878
Indianapolis	695	3659	4201
South Bend	840	4151	4775
INDIANA (Cont'd.)			
Terre Haute	668	3614	4101
IOWA			
Burlington	759	4003	4601
Des Moines	759	4236	4894
Dubuque	871	4702	5402
Keokuk (CO)	667		
Sioux City	756	4528	5326
KANSAS			
Concordia (CO)	562	3505	4091
Dodge City	535	3343	3867
Goodland	634	4000	4650
Topeka (CO)	537	3294	3830
Topeka	569	3433	4037
Wichita	531	3174	3564
KENTUCKY			
Lexington	613	3187	3746
Louisville (CO)	548	2863	3318
Louisville	567	3097	3444
Pikeville (CO)	512	2795	
LOUISIANA			
Baton Rouge	181	1228	1332
Lake Charles	152	1102	1293
New Orleans (CO)	117	881	993
New Orleans	133	971	
Int.Airport,Moisant	169	1081	1096
Shreveport	240	1689	1784
MAINE			
Caribou	1222	6388	7209
Greenville (CO)	1158	5920	
Portland	998	4916	5438
MARYLAND			
Baltimore (CO)	565	2738	3193
Baltimore	667	3298	3503
Frederick	718	3684	3707
MASSACHUSETTS			
Boston	870	3671	4130
Milton	792	4083	
Nantucket	829	3525	4047
Pittsfield	991	5006	5503
MICHIGAN			
Alpena (CO)	1000	4936	5583
Detroit	874	4019	4608
Escanaba (CO)	1040	5187	6013
Grand Rapids (CO)	854	4081	4683
Grand Rapids	898	4366	5081
Lansing	937	4475	5048
Marquette (CO)	1005	5155	5893
Muskegon	897	4338	4970
Sault Ste. Marie	1130	5822	6604
Ypsilanti	876	4138	
MINNESOTA			
Duluth (CO)	1107	6276	6834
Duluth	1159	6391	7112
International Falls	1244	7084	7763
Minneapolis	924	5131	5867
Rochester	925	5275	6032
St. Cloud	1053	5963	6612
MISSISSIPPI			
Jackson	286	1737	1822
Meridian	310	1865	1930
Vicksburg (CO)	250	1587	1656
MISSOURI			
Columbia	617	3330	3940
Kansas City	541	3218	3811
St. Joseph	630	3650	4153
St. Louis (CO)	559	2939	3478
St. Louis	588	3126	3642
Springfield	584	3150	3632
MONTANA			
Billings	684	4221	5161
Glasgow (CO)	930	5443	6549
Great Falls	701	4520	5401
Havre (CO)	774	5119	6102
Helena	842	4877	5983
Kalispell	964	5219	5840
Miles City	774	4808	5813
Missoula	927	4863	5784
NEBRASKA			
Grand Island	672	4182	4805
Lincoln (CO)	637	3884	4490
Lincoln	678	3979	4653
Norfolk	767	4554	5320
North Platte	685	4346	4868
Omaha	667	3948	4733
Scottsbluff	679	4075	4955
Valentine (CO)	670	4240	5191
NEVADA			
Elko	796	4853	5266
Ely	854	4885	5265
Las Vegas	300	1941	2045
Reno	695	3877	4278
Tonopah	649	~~3691~~	4183
Winnemucca	741	4155	4619
NEW HAMPSHIRE			
Concord	985	4846	5525
Mt. Washington	1461	8834	
NEW JERSEY			
Atlantic City (CO)	674	2931	3331
Newark	707	3355	3883
Trenton (CO)	674	3291	3760
NEW MEXICO			
Albuquerque	503	3049	3441
Clayton	572	3369	3781
Roswell	407	2648	2768
NEW YORK			
Albany	935	4600	5080
Binghamton	952	4746	5408
Buffalo	886	4213	4823
New York (CO)	688	3135	3670
La Guardia Field	688	3055	3631
Rochester	913	4352	4913
Schenectady	902	4317	
Syracuse	893	4350	4711
NORTH CAROLINA			
Asheville (CO)	586	2948	3105
Asheville	638	3322	
Charlotte	462	2314	2555
Greensboro	544	2763	2991
Hatteras (CO)	396	1646	1802
Raleigh (CO)	466	2270	2434
Raleigh	493	2454	2649
Wilmington	358	1748	1865
Winston-Salem	517	2572	2921
NORTH DAKOTA			
Bismarck	866	5634	6718
Devils Lake (CO)	1091	6435	7345
Fargo	1075	6202	6917
Grand Forks	1111	6509	
Pembina	1154	6554	
Williston (CO)	896	5637	6713
OHIO			
Akron	871	4163	4497
Cincinnati (CO)	573	2991	3465
Cincinnati	652	3399	3899
Cleveland (CO)	784	3561	4089
Cleveland	796	3808	4332
Columbus	714	3663	4179
Dayton	731	3648	4163
Sandusky (CO)	779	3662	4235
Toledo	822	4021	4629
Youngstown	879	4213	4467
OKLAHOMA			
Oklahoma City (CO)	359	2551	2040
Oklahoma City	379	2582	2932
Tulsa	391	2542	2882
OREGON			
Astoria	553	3118	
Burns (CO)	786	4325	5049
Eugene	604	3042	3394
Meacham	794	4647	5356
Medford	570	3107	3338
Pendleton	722	3427	3956
Portland (CO)	558	2677	3012
Portland	624	3046	3331
Roseburg	533	2808	
Salem	614	3099	3262
Sexton Summit (CO)	608	3901	4079
PENNSYLVANIA			
Allentown	783	3944	4356
Harrisburg	710	3563	3943
Park Place (CO)	948	4656	5154
Philadelphia (CO)	625	2937	3394
Philadelphia	661	3227	3656
Pittsburgh (CO)	685	3312	3761
Pittsburgh	777	3844	4370
Reading (CO)	685	3343	3790
Scranton (CO)	793	3982	4441
Williamsport	803	4072	4387
RHODE ISLAND			
Block Island	781	3379	3944
Providence	825	3892	4365
SOUTH CAROLINA			
Charleston (CO)	256	1278	1466
Charleston	292	1539	1629
Columbia (CO)	317	1690	1889
Columbia	352	1911	2012
Florence	341	1784	2090
Greenville	439	2217	2425
Spartanburg	457	2274	2430
SOUTH DAKOTA			
Huron	819	5261	5923
Pierre	698	4711	
Rapid City	661	4214	5370
Sioux Falls	879	5231	5911
TENNESSEE			
Bristol	596	3063	3203
Chattanooga	463	2548	2693
Knoxville	497	2686	2044
Memphis	399	2343	2547
Nashville	491	2681	2786
TEXAS			
Abilene	260	1908	2200
Amarillo	450	2802	3362
Austin	165	1333	1452
Brownsville	43	394	543
Corpus Christi	64	629	887
Dallas	232	1770	1909
Del Rio	125	1207	1239
El Paso	338	2088	2201
Ft. Worth	247	1843	1958
Galveston (CO)	115	819	1005
Galveston	123	865	1029
Houston (CO)	109	911	1083
Houston	138	1012	1168
Laredo	43	670	710
Lubbock	445	2608	2869
Midland	309	1919	
Port Arthur	164	1132	1267
San Angelo	241	1773	1788
San Antonio	142	1168	1355
Victoria	100	867	969
Waco	231	1611	1696
Wichita Falls	294	2064	2475
UTAH			
Milford	821	4363	4783
Salt Lake City (CO)	768	3464	4076
Salt Lake City	793	3759	4358
VERMONT			
Burlington	1058	5113	5698
VIRGINIA			
Lynchburg	588	2932	3193
Norfolk	508	2322	2630
Richmond	556	2744	3068
Roanoke	585	2938	3194
WASHINGTON			
Olympia	645	3642	3822
Seattle (CO)	548	2855	3131
Seattle-Tacoma	630	3454	3700
Spokane	886	4385	4981
Tatoosh Island (CO)	581	3519	3803
Walla Walla (CO)	662	3119	3737
Yakima	809	4102	4519
WEST VIRGINIA			
Charleston	596	3079	3357
Elkins	799	4166	4222
Huntington (CO)	566	2976	3162
Parkersburg (CO)	625	3256	3599
Petersburg (CO)	667	3443	3768
WISCONSIN			
Green Bay	1040	5162	5977
La Crosse	896	4778	5739
Madison (CO)	892	4585	5371
Madison	895	4639	5476
Milwaukee (CO)	858	4194	4942
Milwaukee	887	4405	5141
WYOMING			
Casper	771	4521	5440
Cheyenne	724	4302	5181
Lander	797	4631	6012
Rock Springs	904	4968	5992
Sheridan	731	4560	5675

Data from airport unless otherwise specified. CO indicates data from city office.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4

FEBRUARY 1954

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Atlanta, Ga.	3	3:30 p.m.					$500		Wind	Strong gusty winds blew down a large tree, which crushed roof of home and slightly damaged roofs of homes on each side.
Eastern Massachusetts, Rhode Island, and extreme eastern Connecticut	3-4	10 p.m.-1:30 a.m.				Several	5,000		Electrical	Winter thunderstorm. Most damage in vicinity of Fall River, Mass. 2 cows killed; phone cable damaged in half a dozen places, causing disruption of service to several hundred phones; barn and repair shop set afire.
Pennsylvania, southeastern counties	8-9					12			Snow	2-inch snowfall glazed most roads with scores of minor skidding accidents in area; at least 12 persons injured. Local amounts up to estimated 12 inches in southeastern York and southeastern Lancaster Counties seriously hampered travel.
New Jersey, entire State	11-12	P.m., 11th-a.m., 12th							Wind	Sporadic statewide damage, mostly minor, to trees, roofs, TV antennae, and power and communications lines.
Lake Champlain (near Burlington), Vt.	12	9:15-11:40 a.m.			0	0	0	$0	Waterspouts	Irregular formations hanging under cloud base seen to develop into funnels and then writhing rope-like appendages extended downward apparently to lake surface. After a few minutes of watching it became evident that these were fully developed, though small, tornadoes or waterspouts. Some spouts appeared to detach themselves from cloud, but continued moving southward and occasionally rejoined cloud base. The north-south limit of the waterspouts was perhaps a little over 2 miles. It was impossible to count them accurately, but a conservative estimate is that 30 to 40 complete funnels and a hundred or more partial ones were seen from WBAS. It is impossible to state definitely that waterspout activity did not extend southward over entire 7 mile stretch of open water. Appendages remained entirely over open water and more than a mile from shore.
Washington, western portion	12-13	Evening of 12th and early morning of 13th					Several thousand dollars		Wind and rain	High winds disrupted power and communication lines. Cruiser sank in Lake Washington. 3 steel smoke stacks blown over in Seattle. Trees damaged in several localities.
Westcliffe, Colo.	13	7:43-7:49 a.m.	10	**900	0	0	2,000	0	Tornadoes	Storm moved northeastward, damaging 3 farm buildings and scattering debris over area of about 1/4 square mile. 2 twisters, causing no damage, were also observed at same time about 3 miles east of main disturbance. Several small twisters observed following path of tornado at intervals of 10 to 15 minutes, further scattering debris from first storm.
Colorado, south-central portion	13-15		*75	150		3	200,000	1,000,000	Winds	Strong winds reaching gale force damaged buildings, automobiles, and transmission lines; drifted soils and caused several moderate forest fires.
Low-lying sections of coastal plain in Los Angeles County from Santa Monica to Long Beach, Calif.	13						170,000		Rain	Heavy rainfall resulted in considerable property damage, due mostly to inundation of low ground. Storm totals ranged from 2 to 4 inches on coastal plain to near 6 inches over nearby mountain areas. Runoff in all districts great, due to excessive rate of rainfall. Inundation occurred in following communities: 1. West Los Angeles 2. Santa Monica 3. Venice 4. Inglewood 5. Torrance 6. Compton 7. East Long Beach 8. Lakewood 9. Artesia 10. Bellflower 11. Norwalk 12. Downey Breakdown of estimated damages, including clean-up and repairs in inundated districts and all others is as follows: Homes (primarily damage to floors) $50,000 Furniture, floor coverings, and furnaces 50,000 Merchandise (retail) in stores 30,000 Streets and lawns 10,000 Automobiles 30,000

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Entrance to Warm Springs Bay, Baranof, Alaska	14	9:58 a.m.	100		0	0	$0	$0	Waterspout	Two observers at Baranof estimated spout to be about 800 feet high and in contact with water. Clockwise rotation observed and funnel was connected to scattered clouds moving south. Weather in area partly cloudy under strong easterly gradient. Observer reported that just before formation of waterspout there was a "terrific wind from the south out of small bay inside of Warm Springs Bay causing a suction lifting the water at least 20 feet and making it look as if it were boiling".
Effingham, Ill.	15	Morning			1				Wind	Wall of building being dismantled blown down, killing 1 man.
Fredonia, Wilson County, Kans.	15	6:30 p.m.	*2	5			115,000		Hail and rain	Heavy hail with rain marked cold front passage throug Fredonia. Small hail beginning west of town fell fo 20 minutes, then, after a lull, large stones up to 2½ inches in diameter fell for 10 minutes, causing severe damage to 2 greenhouses, many roofs, window panes, and neon signs. Hail damage spotted; quite severe damage 4 miles south of Fredonia, in and near Fredonia, and also near Altoona.
Chanute, Neosho County, Kans.	15	Early evening	Narrow	**700			600		Wind	Severe wind squall, described in newspaper accounts as small tornado, developed in small area of Chanute with passage of cold front. Porch, garage, automobile, plate-glass window, and TV antennae damaged.
Pleasanton (3 miles southeast of), Linn County, Kans.	15	Evening				1	6,000		Electrical	Lightning strike knocked man unconscious. Home destroyed by fire.
South Bend, St. Joseph County, Ind.	15	7:30 p.m.					3,000		Electrical and rain	Lightning damage to power and telephone lines about $1,000; remainder of damage in form of highway washouts caused by heavy rain.
Clarksville, Ark.	15	8:10-8:15 p.m.	100	1	0	24	325,000	0	Tornado	Storm progressed northeastward. Gymnasium of College of Ozarks destroyed. 8 homes destroyed and 160 damaged; 60 other buildings destroyed and 172 damaged. Several persons reported seeing funnel cloud.
Pekin, Ill.	15	8:45 p.m.					2,000		Electrical	Lightning set fire to home.
Conway County (southwestern portion), Ark.	15	10 p.m.					8,000		Wind	Considerable damage to houses, barns, and outbuildings over wide area.
Kellum Community, Sevier County, Ark.	15	10 p.m.	150		0	0			Tornado	Home damaged and barn destroyed. Path cut through timber.
Walkerton, St. Joseph County, Ind.	15	10:40 p.m.					500		Electrical	Lightning struck residence, damaging plastering, window frames, siding, and electrical wiring.
Boswell (northern portion), Benton County, Ind.	15	P.m.					500		do	Lightning struck residence damaging television, 2 radios, and some furniture.
Springfield, Ill.	15	11:55 p.m.					5,000		Electrical and hail	Barn destroyed by lightning. Hail killed a large number of birds.
Hoopeston, Ill.	16	12:15 a.m.					1,000		Wind	Considerable damage to telephone lines. Store window blown in.
Cobden, Ill.	16	12:15 a.m.					10,000		do	Several buildings damaged, and many trees blown down.
Conant-Pinckneyville area, Ill.	16	12:30 a.m.					8,000		do	Church moved off foundation at Conant and several farm buildings damaged.
Little Rock, Ark.	16	1 a.m.				1			Electrical	1 person severely burned by lightning.
Chelford, Mississippi County, Ark.	16	2:30-2:35 a.m.	880	2	1	4	50,000	0	Tornado	Storm progressed northeastward. A church, a school, and 4 houses destroyed.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons: Killed	Number of persons: Injured	Estimated damage: Property (exclusive of crops)	Estimated damage: Crops	Character of storm	Remarks
Water Valley, Graves County, Ky.	16	2:30 a.m.					$1,000		Wind, rain, and electrical	Storm accompanied by heavy rain and lightning blew roofs off several barns, uprooted trees, and toppled telephone poles, and television aerials.
Buffalo (southeastern portion), White County, Ind.	16	Early a.m.					2,000		Electrical	Two-story residence struck by lightning and severely damaged.
Alcorn County, Miss.	16	9:30 a.m.					2,500	$500	Wind and rain	Squall line moving eastward, damaged residence, barn, and several other outbuildings about 3 to 4 miles northeast of Corinth.
Central and northern portions of Maine, New Hampshire, and Vermont	16-18	Midday of 16th-early a.m. of 18th				5			Snow	Heaviest snowstorm in several years. Maximum depths to more than 2 feet in northern parts of Vermont and New Hampshire and central portions of Maine; more than a foot of snow over a considerably larger area. Greatest damage to telephone and power lines. Many communities without electric power for several hours or longer and telephone service disrupted for thousands of users. Storm halted airplane flights, delayed trains and buses, and slowed highway traffic to a crawl as many roads were turned into slushy quagmires.
Sturgis, Union County, Ky.	16	1 p.m.					800		Wind and rain	TV aerials toppled, and roof on building damaged. Part of damage caused by rain entering stores in building through damaged roof.
Elizabethtown, Hardin County, Ky.	16	3:30-4 p.m.					10,000		Wind	Storm toppled chimney and tore roof off manufacturing building. Several residences also damaged. Trees uprooted and television antennae blown down.
Michigan City, La-Porte County, Ind.	16	P.m.					2,000		Electrical	Lightning severely damaged a two-story brick residence, although no fire resulted.
Atlanta (northern and western portions), Ga.	16	Early night					500		Wind, electrical, and rain	High winds and lightning in North Fulton Park damaged electrical lines, disrupting services. Heavy rains and lightning damaged cables, disrupting several hundred telephones.
Near Sharon, York County, S. C.	16	8-8:30 p.m.					3,000		Wind	Squall line passed.
Spartanburg, S. C.	16	8-8:30 p.m.					0	0	do	No damage but wind 78 m.p.h.
Gaffney, S.C.	16	8:02 p.m.	50	1	0	0	3,000	0	Tornado	Funnel-shaped cloud observed dipping.
Covington, Tipton County, Tenn.	16	Night					7,000		Wind (possible tornado)	Windstorm blew down approximately 8 barns and outbuildings and unroofed 6 houses. Storm just hit in spots over County.
Belleview, Iron County, Mo.	16					1	500		Electrical	Telephone exchange struck; telephone operator burned severely on left arm while holding receiver. Switching equipment damaged.
New York, western, central, and northern portions	16-17								Rain and snow	Heavy rain, ranging up to 4 inches, caused extensive flooding in west while rain and ice jams brought much flooding in central. No particularly heavy individual loss, but aggregate damage mounted to sizable total. Thousands of cellars flooded, lowlands flooded and eroded, and culverts, bridges, and canal locks damaged. In north snow ranged up to 21 inches in depth. Many roofs collapsed, highways blocked, schools closed, and highway traffic disrupted.
Upland sections of northwestern Massachusetts and southern Bennington County, Vt.	17	Morning				1			Ice (glaze)	Rain occurring with temperature slightly below 30° produced serious glazing conditions. Many power lines grounded by broken ice laden branches, and some communities without electric power for several hours. Vehicular traffic slowed to a crawl and a number of school sessions cancelled because school buses unable to proceed. 1 person injured by contact with "live" power line.
Colorado, eastern portion	18, 19, and 22		*200	300			25,000	5,000,000	Wind and dust	Strong winds ripped and drifted topsoils; visibility reduced to near zero at many points; dust clouds rose to elevations of 8,000 feet. Highways and roads drifted over and transportation slowed. Schools closed in some sections. Heaviest damage to winter grains, grasses, and soils.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Oklahoma, western sections	19	2 a.m.-6 p.m.			1	2	Considerable	Considerable	Wind and dust	Winds, with estimated speeds of 60 to 85 m.p.h., caused considerable damage to small buildings, store windows, trees, and several large buildings under construction. Power and communication lines damaged, disrupting electrical and communication services in many communities. Accompanying dustorm, reducing visibility to zero in many places, was considered worst since 1939. Considerable acreage of cropland blown, but damage to winter crops planted minimized by good root systems. Fence rows extensively damaged as thistles blown in, caught dirt, burying fences. Several traffic accidents as result of restricted visibility.
Andover (2 miles northwest of), Butler County, Kans.	19	Early a.m.					$3,000		Electrical	Fire caused by lightning destroyed barn and contents.
Gorman, Eastland County, Tex.	19	5:20 a.m.	15		0	2	7,500	$0	Tornado	13 buildings destroyed; 18 homes and 20 other buildings damaged. Moved northeastward.
Sulphur Springs (near), Hopkins County, Tex.	19	8:15 a.m.	880	2			2,500	1,000	Wind and electrical	Lightning struck house and caused fire. 2 barns demolished by wind. In Rockdale community 3 miles southwest of Sulphur Springs.
Conroe, Montgomery County, Tex.	19	1:30 p.m.	150		0	7	200,000	0	Tornado	4 homes and 10 other buildings destroyed; 9 homes and 4 other buildings damaged. Timber broken. Touched ground 3 times. Moved northeastward.
Kansas, western portion	19	Most of day			6	Numerous			Wind, dust, and blizzard	Northwesterly winds reached gale speeds early on 19th in western part as an intensifying low pressure center moved eastward across State. Sustained speeds of 50 to 60 m.p.h. caused what was probably the worst duststorm since the 1930's in southwest and extreme west. Blizzard conditions followed duststorm. Zero visibility at many locations in both dust and snow. Traffic halted by drifts of snow, dust, and weeds; fences, communications, and power lines blown down; many cattle drifted from home pastures; and much damage done to wheat fields.
Berryville (5 miles south of), Carroll County, Ark.	19	1:45 p.m.							Wind	House severely damaged and tool shed destroyed.
Shreveport and Bossier City in Caddo and Bossier Parishes, La.	19	2:15 p.m.					8,000		Wind, rain, and electrical	Squall line with heavy lightning and winds reported to be 70 m.p.h. destroyed and damaged a number of buildings in Shreveport and Bossier City areas, and damaged power lines and trees. Moved eastward. Thick dust that reduced visibility to less than ½ mile began about 8 p.m. and lasted about 18 hours.
Sedgwick County, (west-central portion), Kans.	19	3:45 p.m.		½	0	0	0	0	Tornado	Small tornado cloud clearly seen aloft reportedly moving southeastward near Sedgwick-Reno County border. Tornado reported in Harper County about same time, but no details or confirmation obtainable.
Sulphur Springs Community, Jefferson County, Ark.	19	3:45 p.m.	150	1-1/4	0	1	20,000	0	do	Several persons reported observing small light-colored funnel-shaped cloud moving northeastward. Storm destroyed 6 houses, damaged 3 houses, and destroyed 2 other buildings.
Greenwood, Sebastian County, Ark.	19	4:45-5:55 p.m.	33	1	0	0	665	15	do	Funnel cloud observed to progress north-northeastward. 1 house damaged and 2 outbuildings destroyed. Several abandoned military buildings on Camp Chaffee Reservation damaged or destroyed.
Angola, West Feliciana Parish, La.	19	9:25 p.m.	100	½	1	2	2,500	0	Tornado and electrical	Hit first offenders camp at State Penitentiary, killing 1 person; lightning injured 2 others. Unroofed dormitory and damaged several guard towers and power lines. Lasted about 5 minutes; moved northeastward.
South Dakota, extreme eastern portion	19	Night			2	22			Snow	Heavy snow disrupted highway travel and was indirectly responsible for serious highway accidents. Snow preceded by freezing rain in extreme southeast, which caused some telephone and power line failures.
Eckley, Colo.	19	10-10:10 p.m.					100		Winds	Abrupt stop of high winds from 45 to 50 m.p.h. for period of 5 to 10 minutes (eye of storm), followed by similar wind speeds immediately afterwards. Limited damage to transmission lines.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons: Killed	Number of persons: Injured	Estimated damage: Property (exclusive of crops)	Estimated damage: Crops	Character of storm	Remarks
Clarke, Lauderdale, Wayne, Greene, Perry, Forrest, and Marion Counties, Miss.	19-20	11 p.m.-7 a.m.					$15,000	$2,500	Winds, rain, and electrical	Severe squall lines across southeastern portion of State destroyed several buildings and damaged others. Thunder and lightning almost continuous from about 1 a.m. until 6 a.m.; rain excessive and traffic on highways at a standstill, winds strong enough to move cars about when it was possible for them to travel.
New Mexico, eastern portion	19								Wind	Straight-line winds 60 to 70 m.p.h., with gusts to 90 m.p.h., reported. Some damage to roofs, signs, plate-glass windows, and TV antennae. Severe dust. Serious soil erosion in winter wheat fields.
Minnesota, extreme southwestern counties	19-20						10,000		Ice (glaze), sleet, snow, and wind	A number of poles broken or left leaning and wires down, seriously disrupting communication and electric power services. Many branches of trees broken off. Freezing rain coated highways, roads, and sidewalks with ice which made driving and walking hazardous, delaying traffic.
Lamar, Covington, Jones, and Jasper Counties, Miss.	20	12:35 a.m.	200	50	0	10	300,000	2,500	Tornado, wind, rain, and electrical	Tornado developed within line of squalls about 10 miles southwest of Sumrall in Lamar County. Moving northeastward, it struck east side of Sumrall, doing $250,000 property damage. Destroyed 20 and damaged 25 homes, destroyed 3 and damaged 10 other buildings. Then passed through thinly settled, mostly wooded areas of southeastern Covington County into Jones County where it struck a small community 6 miles west of Laurel. Damage in Jones County includes 50 houses, 60 barns, much timber, and agriculture supplies in storage. Then moved into southern Jasper County where it dissipated within same line of squalls.
Buckley-Loda area, Iroquois County, Ill.	20	1 a.m.					3,000		Wind	Several farm buildings damaged.
Newton and Neshoba Counties, Miss.	20	1:30-2:15 a.m.	100	25	0	0	100,000	1,000	Tornado, wind, rain, and electrical	First indications near Decatur in Newton County where 3 homes destroyed and 17 damaged, with 4 other buildings destroyed and 20 damaged. Then tornado must have lifted and come down again near House community about 12 miles south-southeast of Philadelphia, where 10 persons injured, 20 homes destroyed and 25 damaged, several outbuildings destroyed and damaged; then dissipated in same line of squalls. Moved northeastward.
Lexington, Fayette County, Ky.	20	A.m.					1,500		Wind	Wind swept metal implement shed from its foundation and demolished it.
Cora Community (near Jay), Santa Rosa County, Fla.	20	Night			0	0		0	Tornado	Demolished small frame residence.
Montgomery County, N. C.	21	5 a.m.	25	20	0	0	10,000		do	Storm moved on skipping path from point south of Mt. Gilead northeastward to Candor. Several roofs destroyed or damaged; 1 house displaced on foundation. Transmission lines disrupted.
Wake and Lee Counties, N. C.	21	Morning					10,000		Rain	Heavy rain (over 3 inches) filled storm sewers and caused flooding in low places. Several houses flooded in Raleigh and Sanford. 50 telephones reported out of order in Sanford. Some damage to highway fills.
Idaho, all sections	21	A.m. in north to late p.m. in southeast							Wind	Trees blown down at scattered points; power lines [illegible]ned at Nezperce; several barns and sheds overturned and 1 house roof blown off in southwestern counties. Gusts to 72 m.p.h. at Lewiston with passage of cold front in midforenoon.
Connellsville, Pa.	21	Day							do	Concrete block chicken house blown down, roof carried 150 feet. Farm house toppled and its roof torn off. Wind caused tree, wire, and window damage.
Philadelphia and Phoenixville areas, Pa.	21	3-5 p.m.							do	Strong, gusty winds damaged 4 airplanes at Philadelphia Northeast Airport, felled at least 2 chimneys, damaged many tin roofs, broke many windows with debris, and felled trees in many sections which blocked highways in some areas. Much wire damage from fallen trees and branches. Gusts reached 65 m.p.h.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Helena, Mont.	21	3-3:40 p.m.					$1,000		Wind	
Butte, Mont.	21	3:15-3:45 p.m.					75,000		do	High wind reported over Lewis and Clark, Silver Bow, southern Powell, and Deer Lodge Counties.
Del Ray Beach (1 to 5 miles west of), Fla.	21	5 p.m.							Hail and wind	Hail fell for 15 minutes and covered ground with marble-size stones and caused considerable damage to beans and peppers on several farms. Wind estimated at 80 m.p.h. damaged roofs and downed trees.
Honolulu and vicinity, Hawaii	22	3-5 p.m.					5,000		Rain	Basements flooded. Landslide blocked mountain road.
Annette (5 miles southeast of), Alaska	23	9:13-9:16 a.m.	35	5	0	0	0	$0	Water-spout	Observed about 5 miles southeast of Annette WBAS in vicinity of Hot Spur Island moving northeastward to vicinity of Annette Point where it rapidly dissipated. Funnel extended downward over water from base of cumulus type cloud and approached, but was not observed to be in contact with, the surface. Sky was broken with base of clouds 1,800 feet above sea level. Light rain showers.
Great Falls, Mont.	24	10:11 a.m.-2 p.m.					8,000		Wind	Considerable damage to power lines.
Ocala-Orlando-Palatka area, Fla.	24	Noon to mid-afternoon					8,000	Minor	do	Stormy weather associated with passage of squall line. Property damage estimated $7,000 at Groveland (near Orlando) and $1,000 at Horse Landing (near Palatka). Trees blown down at Ocala and Crescent City.
Tampa Bay-Fort Myers-Moore Haven area, Fla.	24	Noon to mid-afternoon			0	0	23,500	Small	Wind (tornadic)	Stormy weather associated with passage of squall line. Property damage estimated $15,000 at Punta Gorda, $8,000 at Bradenton, and $500 at Fort Myers. Roofs, windows, and trees damaged at Moore Haven. Winds estimated 70 to 75 m.p.h. in gusts at Tampa, Bradenton, and Punta Gorda. Damage at Punta Gorda may have been due to tornado.
Billings, Mont.	24	12:30-6:30 p.m.					10,000		Wind	High wind over most of Montana east of Continental Divide, due to southeastward movement of small low pressure system.
Jefferson County, Ky.	25	Evening					1,000		do	Storm felled trees, interrupted electrical service, and shattered window glass. A barge pumping oil lost several hundred gallons of oil when force of wind snapped pumping line.
Colorado, southeastern portion	26		*125	200			10,000	4,000,000	Wind and dust	Conditions similar to storms of 18th, 19th, and 22d, (Colorado, eastern portion), only over more limited area.
Caruthersville, Pemiscot County, Mo.	27	4-5 p.m.					187,000		Hail	Damage to buildings, automobiles, and other equipment. Depth of hail on ground 1½ inches. Size of hail averaged ½ inch; largest size 1 1/4 inches.
West Helena (southwest of), Phillips County, Ark.	27	5:40 p.m.	3	400	0	0	5,000	0	Tornado and hail	Storm moved northeastward, destroying 2 big barns, tractor shed, garage, and grain bin. Hailstones ranged in size from ½ to 1½ inches in diameter.
Paducah, McCracken County, Ky.	27	P.m.					500		Hail and wind	Storm accompanied by high winds damaged several greenhouses. Hail ranged in size from small pebbles to golf balls. All damage by hail.
Birmingham, Ala.	28	Midnight-1 a.m.	100	1			12,500		Thunder-storm	Considerable damage to roofs; porches on several houses facing south blown off; roofs and awnings on many homes damaged; several garages, numerous trees, sign boards, metal awnings, wooden fences, and some telephone poles blown down, and several plate-glass windows blown out.
Chilton County, Ala.	28	2 a.m.	170	10	0	0	5,000	200	Tornado	Major damages occurred in Mt. Pleasant, New Salem, Collins Chapel, and Mineral Springs Communities. Path of storm northeastward. Many persons reported rumbling train-like noise. Garages, small outbuildings, chicken houses, and a few barns destroyed.
Booneville, Owsley County, Ky.	28	4:45 a.m.					15,000		Electrical	Church building completely destroyed by lightning-set fire. An adjacent building also damaged.
West Palm Beach, Fla.	28	A.m.							Thunder-storm	Damaged small craft at docks.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Tavernier and Islamorada, Fla.	28	8:30-9 a.m.		20	0	0	Minor	$0	Hail	Hail was heavy and stones pigeon to hens' eggs size.
Idaho, all sections	28	A.m. in north to p.m. in south							Wind	Strong winds as cold front progressed from extreme north to southern boundary during day. Some trees downed and scattered light damage to buildings.
Pasquotank County, N. C.	28	6 p.m.					$500		Electrical	Lightning struck auction barn north of Elizabeth City; partially burned.
Columbia, S. C.	28	10:35 p.m.			0	0	250	0	Tornado	Not seen, but noise heard, apparently characteristic noise of tornado. Type of damage appeared to justify suspicion of small twister.
Palatka, Fla.	28	11 p.m.							Wind	Demolished concrete block wall of store building under construction.

* Miles instead of yards.
** Yards instead of miles.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

FEBRUARY 1954

There were no major or significant floods during February. All the overflows reported were generally light or minor. The ice on the Missouri River broke up about 3 weeks earlier this year than normal, and in the 99 years of record the ice has broken up earlier only five times. Record low stages were reached on the Scioto River in Ohio.

ST. LAWRENCE DRAINAGE.--Mild weather on the 13th and 14th caused rapid snow melt in the Lake Michigan drainage, and the heavy rains on the 15th and early 16th, resulted in rapid rises in the Grand and its tributaries. Minor flooding occurred on the Red Cedar, the upper Grand, and on the Shiawassee River in the Saginaw Basin. An ice jam on the Grand River at Grand Rapids, Mich., at the North Park Bridge on the 17th backed up water in the low sections of North Park and Comstock Park, threatening the residents in the low areas for several hours before the ice jam gave way, and released the pent-up waters which receded quite rapidly.

Minor flooding occurred along the Black and Oatka Creeks in New York between the 17th and 18th from the heavy rain on the 16th and 17th. No damages resulted.

ATLANTIC SLOPE.--Ice gorges developed in the Mohawk River in New York State during the first 2 weeks of February as a result of warm weather and an early breakup of the river ice. Gorges were particularly bad from Schenectady to St. Johnsville, causing localized flooding in the vicinity of the gorges and flooding of lowlands. Highways along the river were impassable in several localities. An extensive ice jam formed near Freeman's Bridge (downtown Schenectady) and the first lock upstream from the bridge (Lock No. 7). This ice field caused some lowland flooding in Schenectady and considerable damage to the locks. The Ferry Street gage in Schenectady (flood stage 223 feet) was above flood stage from 2:30 p.m. of the 17th to 12:30 a.m. of the 18th (reaching a high of 225.16 feet). Adding to the hazard was about 1 to 2 inches of rainfall over the basin with unusually high temperatures. The larger gorges were broken up on the 21st by blasting.

The light flooding on the Susquehanna and Chenango Rivers was due to moderate to heavy rain on the 17th. High temperatures on the 15th and 16th caused rapid snow melt, resulting in higher stages than normally would occur.

The heavy rain from the 20th to the 22d over eastern North Carolina resulted in light flooding on the Tar, Neuse, and Cape Fear Rivers between the 22d and 28th. The rainfall ranged from 0.5 to 4.0 inches and averaged about 1.5 inches over the drainage basins. No damage was reported.

The Saluda and Broad Rivers overflowed slightly from the 21st to the 22d from the heavy rain (1 to 2 inches) on the 21st. No damage resulted.

EAST GULF OF MEXICO DRAINAGE.--The slight flooding on the Pearl River at Jackson, Miss., and Bogalusa, La., early in the month was due to rains that occurred late in January. No damage resulted from the flooding.

MISSOURI BASIN.--February 1954 was the warmest February on record in the Middle Missouri Basin. Reports from Iowa and South Dakota indicate that the statewide average monthly temperatures were 37° in both states, or 14° above normal in Iowa and 18° above normal in South Dakota. This warm weather caused an early ice breakup on the Missouri River and its tributaries. Since the mild weather was widespread over the Dakotas, the Missouri River ice deteriorated at about the same rate from Sioux City, Iowa, to Mobridge, S. Dak., during the last half of February. The ice aged and fell apart, causing many local breakups without regard to latitude, during the period from the 15th to the 25th. The Missouri River ice was relatively thin, varying from 18 to 20 inches at Sioux City to about 26 inches at Bismarck, N. Dak. Even though the ice breakup was erratic, jams were small, and there was no flooding in connection with the breakup. By March 1 the Missouri breakup was complete to Fort Yates, N. Dak.

The average date of ice breakup on the Missouri at Sioux City is March 10; hence, the breakup was about 3 weeks early this year. In the past 99 years, the ice has broken up earlier only five times, namely, in 1870, 1877, 1878, 1907, and 1928.

OHIO BASIN.--The Scioto River reached a record low February stage of 1.64 feet at Circleville, Ohio, on the 14th and 15th. At Piketon the stage continued at record low levels during the last half of the month.

ARKANSAS BASIN.--Streams in the Arkansas Basin continued at low stages throughout the month. At Tulsa, Okla., the Arkansas River averaged 3.0 feet for the month or 1.6 feet below the normal for the lowest mean February stage of record (47 years). It equalled its previous mean low for February at Van Buren, Ark., (4.1 feet). The Cimarron River at Perkins, Okla., averaged 3.5 feet or 1.2 feet below normal, which equalled the lowest mean monthly stage recorded in February 1953.

RED BASIN.--The light flooding on the Sulphur River from Hagansport to Naples, Tex., and below was due to light to heavy rainfall on the 16th and 19th. Very little damage resulted from the overflow.

LOWER MISSISSIPPI BASIN.--The Mississippi River equalled the previous record low February stage of -0.2 foot set in February 1872 and 1940 at Memphis, Tenn., on the 15th.

PACIFIC SLOPE DRAINAGE.--The heavy precipitation during the period from the 12th to the 18th resulted in the highest flows of the season in streams in the Sacramento Basin. Overflows occurred at Moulton, Colusa, and Tisdale Weirs into Sutter Bypass and at Fremont Weir into Yolo Bypass.

The flooding on the Chehalis River at Centralia and Grand Mound, Wash., on the 21st and 22d was due to generally heavy precipitation from the 11th to the 21st.

FLOOD STAGE DATA

(All dates in February unless otherwise specified)

Table 5

River and station	Flood stage	Above flood stages -dates		Crest*	
		From–	To–	Stage	Date
	Ft.			Ft.	
ST. LAWRENCE DRAINAGE Lake Michigan					
Red Cedar:					
Williamston, Mich.	7	16	17	8.2	16
East Lansing, Mich.	8	17	10	9.2	17
Shiawassee: Owosso, Mich.	7	16	17	7.2	17
Lake Ontario					
Black Creek: Churchville, N. Y.	5	17	19	6.0	18
Oatka Creek: Garbutt, N. Y.	5	16	18	6.0	17
ATLANTIC SLOPE DRAINAGE					
Mohawk: Schenectady, N. Y.	223	17	18	225.2	17
Chenango: Whitney Point, N. Y.	12	17	17	12.1	17
Susquehanna:					
Bainbridge, N. Y.	13	17	18	13.3	18
Conklin, N. Y.	11	17	19	14.5	10
Roanoke: Williamston, N. C.	10	5	8	**10.1	7
Tar:					
Rocky Mount, N. C.	9	22	23	**9.3	23
Tarboro, N. C.	19	24	26	**19.6	26
Neuse:					
Smithfield, N. C.	13	21	24	**14.8	23
Goldsboro, N. C.	14	25	28	14.8	27
Cape Fear: Lock No. 2, Elizabethtown, N. C.	20	22	23	**20.5	23
EAST GULF OF MEXICO DRAINAGE					
Tombigbee:					
Lock No. 4, Demopolis, Ala.	39	Jan. 20	1	47.8	Jan. 27
EAST GULF OF MEXICO DRAINAGE (cont'd.)					
Tombigbee: (cont'd.)					
Lock No. 3, Whitefield, Ala.	33	Jan. 13	3	49.0	Jan. 28
Lock No. 2, Pennington, Ala.	46	Jan. 22	1	50.4	Jan. 29
Lock No. 1, Salitpa, Ala.	31	Jan. 23	4	34.3	Jan. 31
Pearl:					
Jackson, Miss.	10	1	8	20.7	5
Bogalusa, La.	15	2	4	15.3	3
MISSISSIPPI SYSTEM Red Basin					
Sulphur: Naples, Tex.	22	24	27	23.1	25
PACIFIC SLOPE DRAINAGE Sacramento Basin					
Sacramento:					
Moulton Weir, Calif.	76.7	18	22	79.4	19
Colusa Weir, Calif.	61.8	13	24	66.0	19
Tisdale Weir, Calif.	45.5	13	28	49.0	20
Fremont Weir, Calif.	33.8	14	27	35.9	20
Miscellaneous Basins					
Chehalis:					
Centralia 1W, Wash.	63.0	21	22	65.0	22
Grand Mound, Wash.	14.5	21	22	14.8	22

* Provisional

** Highest stage reported, but not necessarily the crest

RADIOSONDE DATA

Average monthly values

Table 20

FEBRUARY 1954

Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
	ALBUQUERQUE, N. MEX. (840 MB.)				ATLANTA, GA. (981 MB.)				BISMARCK, N. DAK. (953 MB.)				BOISE, IDAHO (922 MB.)				BROWNSVILLE, TEX. (1017 MB.)				BUFFALO, N. Y. (987 MB.)				BURRWOOD, LA. (1018 MB.)			
SURFACE	28	1,619	9.0	27	28	309	9.0	61	28	505	0.8	77	28	868	3.4	76	28	7	17.8	79	28	221	0.2	73	28	3	15.2	88
1,000	28	140			28	151			28	113			28	198			28	150	18.7	69	28	114			28	152	16.6	69
950	28	577			28	581	10.4	47	28	535	1.0	72	28	622			28	596	18.3	48	28	531	- .7	65	28	594	14.6	57
900	28	1,044			28	1,027	8.0	48	28	967	2.0	57	28	1,061	5.0	61	28	1,053	16.2	43	28	955	2.5	65	28	1,043	12.4	46
850	28	1,518			28	1,496	5.2	47	28	1,427	.4	51	28	1,527	3.5	56	28	1,537	13.9	41	28	1,406	- 4.9	65	28	1,521	10.2	39
800	28	2,022	8.6	24	28	1,989	3.7	36	28	1,911	- 1.9	53	28	2,018	2.4	44	28	2,045	11.3	41	28	1,881	- 7.1	65	28	2,022	7.8	35
750	28	2,556	4.4	27	28	2,517	1.3	32	28	2,429	- 5.1	53	28	2,543	- .2	46	28	2,589	8.5	39	28	2,386	- 9.4	62	28	2,559	4.8	34
700	28	3,109	.2	30	28	3,064	- 1.5	31	28	2,960	- 8.4	55	28	3,086	- 3.6	46	28	3,149	5.1	34	28	2,914	-11.7	55	28	3,111	1.8	32
650	28	3,701	- 4.1	30	28	3,655	- 4.8		28	3,541	-11.9	54	28	3,674	- 7.3	50	28	3,755	1.0	37	28	3,483	-14.7	52	26	3,705	- 1.8	
600	28	4,325	- 8.5	27	28	4,276	- 8.4		28	4,139	-15.6	53	28	4,288	-11.1	47	28	4,388	- 3.1	35	28	4,081	-17.9	45	26	4,333	- 5.9	
550	28	4,994	-12.9		28	4,947	-12.9	30	28	4,794	-19.7	45	28	4,955	-15.3	42	28	5,073	- 7.8		28	4,725	-22.2	48	26	5,010	-10.1	
500	27	5,714	-18.0		28	5,666	-17.9	30	28	5,491	-24.8	45	28	5,661	-20.0	41	28	5,806	-13.0		28	5,420	-26.7	49	26	5,738	-14.9	
450	27	6,500	-23.9		28	6,452	-23.9		27	6,261	-30.1	46	28	6,446	-25.5	42	28	6,611	-18.5		28	6,178	-31.4	48	26	6,536	-20.8	
400	27	7,342	-30.3		28	7,293	-30.4		27	7,079	-36.2	45	28	7,281	-31.9	42	28	7,471	-24.8		28	6,998	-37.1		26	7,387	-26.9	
350	27	8,276	-37.8		28	8,228	-37.7		26	7,988	-42.7		28	8,209	-39.4		28	8,427	-32.0		27	7,901	-43.4		26	8,335	-34.3	
300	27	9,321	-45.4		28	9,272	-45.5		25	9,024	-49.5		28	9,245	-47.8		28	9,496	-40.3		27	8,921	-50.0		25	9,398	-42.1	
250	27	10,514	-53.3		28	10,467	-52.4		24	10,205	-54.5		28	10,424	-55.8		28	10,711	-49.5		26	10,103	-54.3		25	10,607	-50.2	
200	27	11,927	-59.1		27	11,885	-55.8		24	11,620	-57.2		26	11,831	-60.9		27	12,146	-56.7		25	11,525	-54.8		25	12,043	-55.6	
175	27	12,761	-60.0		26	12,728	-56.2		24	12,465	-56.9		26	12,666	-58.5		27	12,984	-59.9		25	12,381	-53.9		25	12,888	-58.0	
150	27	13,722	-59.9		25	13,707	-57.5		24	13,443	-55.6		26	13,634	-58.5		27	13,937	-63.8		24	13,362	-54.4		25	13,851	-61.2	
125	27	14,855	-62.3		25	14,850	-60.6		24	14,601	-56.6		26	14,777	-60.1		27	15,043	-68.0		24	14,526	-55.8		24	14,977	-65.6	
100	26	16,216	-65.6		25	16,226	-63.9		23	16,014	-57.2		23	16,163	-61.4		25	16,370	-72.5		23	15,940	-57.5		24	16,318	-69.8	
80	25	17,570	-65.7		22	17,582	-63.5		21	17,426	-57.5		22	17,547	-61.8		19	17,672	-72.8		21	17,335	-58.5		22	17,651	-69.9	
60	22	19,321	-63.3		21	19,348	-62.5		20	19,229	-58.0		18	19,336	-60.1		17	19,386	-66.0		19	19,165	-59.1		16	19,375	-64.7	
50	20	20,448	-61.4		50	20,478	-60.1		16	20,393	-58.2		13	20,480	-58.9		17	20,502	-61.8		16	20,347	-58.6		12	20,508	-61.4	
40	11	21,869	-59.0		18	21,889	-58.6		10	21,756	-58.9		8	21,877	-58.0		14	21,887	-58.8		10	21,739	-58.8		6	21,905	-58.7	
30					12	23,709	-56.7										7	23,693	-55.7									
	CARIBOU, ME. (988 MB.)				CHARLESTON, S. C. (1015 MB.)				COLUMBIA, MO. (986 MB.)				DODGE CITY, KANS. (924 MB.)				EL PASO, TEX. (884 MB.)				ELY, NEV. (813 MB.)				GLASGOW, MONT. (938 MB.)			
SURFACE	28	191	- 6.5	81	28	13	9.6	80	28	238	6.1	58	27	792	6.8	50	28	1,195	13.8	26	28	1,908	0.4	65	28	648	0.4	73
1,000	28	96			28	140	12.9	62	28	117			27	131			28	138			28	200			28	126		
950	28	503	- 5.4	73	28	578	11.6	52	28	543	6.3	51	27	561			28	583			28	634			28	548		
900	28	922	- 6.5	67	28	1,020	8.5	54	28	981	3.9	52	27	1,011	10.6	37	28	1,045			28	1,074			28	981	4.2	48
850	28	1,368	- 7.4	67	28	1,490	5.8	49	28	1,444	2.8	49	27	1,485	8.6	35	28	1,526	13.0	23	28	1,542			28	1,444	2.5	42
800	28	1,839	- 8.8	66	28	1,984	3.5	41	28	1,933	1.0	46	27	1,984	6.0	32	28	2,032	9.3	26	28	2,036	3.5	49	28	1,931	- .6	43
750	28	2,345	-10.5	58	28	2,516	1.2	36	28	2,456	- 1.5	42	27	2,512	3.1	32	28	2,570	5.9		28	2.560	2.2	39	28	2,447	- 4.3	49
700	28	2,866	-12.7	56	28	3.058	- 1.2	33	28	2,997	- 4.5	38	27	3,064	- .7	33	28	3,124	2.2		28	3,112	- 1.3	38	28	2,983	- 7.9	48
650	28	3,435	-15.4	55	28	3,653	- 4.8		28	3,582	- 7.8	38	27	3,653	- 5.1	36	28	3,720	- 1.8		28	3,704	- 4.9	36	28	3,561	-11.6	41
600	28	4,029	-19.1	56	28	4,270	- 8.7	37	28	4,195	-11.4	37	27	4,276	- 9.5	36	28	4,349	- 6.4		28	4,324	- 8.6	34	28	4,163	-15.6	38
550	28	4,676	-22.9	54	28	4,944	-13.1		28	4,859	-16.0	37	27	4,942	-14.5	36	28	5,025	-11.3		28	4,995	-12.7		28	4,815	-19.9	38
500	28	5,363	-27.2	52	28	5.657	-18.1		27	5,568	-21.0		27	5,657	-19.4		28	5,748	-16.4		28	5,715	-17.5		28	5,514	-24.8	37
450	28	6,121	-32.4	48	28	6,442	-23.8		27	6,344	-26.7		27	6,436	-25.1		28	6,535	-22.5		28	6,500	-23.5		28	6,279	-30.4	37
400	28	6,935	-37.9		28	7,285	-30.2		27	7,177	-33.2		27	7,276	-31.6		28	7,386	-28.9		28	7,344	-30.0		28	7,099	-36.1	
350	27	7,831	-44.1		28	8,219	-37.5		27	8,100	-40.4		27	8,207	-38.9		28	8,326	-36.3		28	8,279	-37.9		28	8,012	-42.9	
300	27	8,848	-50.4		28	9,264	-45.3		27	9,132	-48.3		27	9,247	-46.5		28	9,376	-44.4		28	9,320	-46.3		28	9,035	-49.8	
250	26	10,029	-55.5		28	10,459	-52.2		27	10,309	-55.9		27	10,436	-54.0		28	10,572	-52.9		28	10,506	-55.0		28	10,211	-55.0	
200	26	11,446	-56.2		28	11,890	-54.5		27	11,719	-58.4		26	11,843	-59.4		27	11,984	-58.6		27	11,916	-61.0		26	11,621	-56.6	
175	25	12,301	-55.0		28	12,743	-55.5		27	12,559	-57.4		24	12,668	-58.6		26	12,816	-59.4		26	12,740	-59.6		24	12,461	-55.5	
150	25	13,285	-54.6		28	13,719	-58.0		25	13,536	-57.2		23	13,630	-57.7		25	13,779	-59.8		24	13,712	-58.3		23	13,447	-54.9	
125	25	14,450	-54.8		27	14,857	-61.4		25	14,684	-59.6		22	14,779	-59.7		19	14,909	-62.7		23	14,854	-60.7		23	14,611	-55.4	
100	25	15,870	-56.8		24	16,240	-64.9		25	16,075	-60.9		21	16,172	-61.5		15	16,278	-67.0		23	16,229	-64.0		22	16,034	-56.8	
80	25	17,278	-58.0		24	17,598	-65.0		23	17,461	-61.8		21	17,551	-62.3		13	17,617	-67.7		23	17,595	-63.8		19	17,451	-57.1	
60	18	19,103	-58.5		22	19,364	-62.0		20	19,232	-61.3		18	19,330	-61.0		8	19,372	-62.7		18	19,328	-62.1		18	19,267	-56.8	
50	15	20,272	-59.5		20	20,488	-60.4		16	20,365	-61.2		12	20,462	-60.4		6	20,507	-60.4		17	20.463	-60.8		14	20,455	-56.6	
40	11	21,718	-59.3		16	21,908	-57.7		11	21,738	-60.6		5	21,874	-56.9						11	21,859	-58.9		8	21,888	-56.6	
30					10	23,719	-55.4		6	23,582	-59.0										7	23,659	-57.0		5	23,725	-56.5	
	GRAND JUNCTION, COLO. (856 MB.)				GREAT FALLS, MONT. (886 MB.)				GREEN BAY, WIS. (987 MB.)				GREENSBORO, N. C. (985 MB.)				HATTERAS, N. C. (1017 MB.)				HILO, T. R. (1013 MB.)				INTERNAT. FALLS, MINN. (967 MB.)			
SURFACE	28	1,474	4.9	46	28	1,128	3.6	53	28	210	- 2.0	74	28	273	6.3	63	28	3	9.4	77	28	9	24.3	71	27	360	- 5.2	76
1,000	28	176			28	126			28	105	- 7.3		28	143			28	141	10.6	62	28	122	22.6	73	27	93		
950	28	612			28	557			28	520	- 1.3	64	28	572	8.4	48	28	570	8.2	51	28	572	18.9	77	27	500	- 3.9	73
900	28	1,060			28	997			28	943	- 3.2	60	28	1,012	5.5	50	28	1,010	5.3	51	28	1,029	15.6	81	27	926	- 3.4	69
850	28	1,529	6.8	38	28	1,461	3.7	42	28	1,394	- 5.0	58	28	1,476	2.5	52	28	1,475	2.6	51	28	1,512	12.8	80	27	1,377	- 4.7	60
800	28	2,027	5.5	32	28	1,950	.7	45	28	1,868	- 6.3	55	28	1,965	.3	51	28	1,963	.2	46	28	2,021	11.0	59	27	1,853	- 6.3	56
750	28	2,556	1.9	34	28	2,468	- 2.9	47	28	2,377	- 8.4	48	28	2,486	- 1.5	43	28	2,486	- 1.5	38	28	2,569	9.8		27	2,359	- 8.7	47
700	28	3,103	- 1.9	34	28	3,008	- 6.4	49	28	2,904	-11.1	49	28	3,027	- 4.2		28	3,025	- 4.0	37	28	3,129	7.4		27	2,887	-11.4	45
650	28	3,695	- 6.0	38	28	3,586	-10.2	47	28	3,474	-14.2	49	28	3,615	- 7.1	39	28	3,613	- 6.8	34	27	3,741	4.0		27	3,456	-14.5	45
600	28	4,310	- 9.9	38	28	4,195	-14.3	43	28	4,072	-17.6	45	28	4,228	-10.7	34	28	4,226	-10.4	34	27	4,382	- .3		27	4,053	-18.3	45
550	28	4,978	-13.9	38	28	4,846	-18.8	43	28	4,721	-21.4	46	27	4,899	-14.7		28	4,894	-14.9	36	26	5,073	- 4.7		27	4,702	-22.5	46
500	27	5,689	-19.1	39	28	5,552	-23.9	44	28	5,414	-25.8		27	5,607	-19.8		28	5,604	-19.7	32	26	5,816	- 9.5		27	5,391	-27.2	48
450	27	6,471	-24.8	36	28	6,316	-29.3	42	28	6,173	-31.1		27	6,388	-25.5		28	6,386	-25.3		26	6,630	-15.6		27	6,149	-32.5	48
400	27	7,309	-31.5	36	28	7,144	-35.5		28	6,994	-36.9		27	7,223	-31.6		28	7,221	-31.6		26	7,500	-22.0		27	6,962	-38.4	
350	27	8,238	-38.8		28	8,059	-42.5		28	7,904	-43.3		27	8,153	-38.6		28	8,151	-38.4		24	8,468	-29.0		27	7,868	-44.1	
300	27	9,277	-47.2		28	9,082	-50.2		28	8,926	-49.5		27	9,194	-46.0		28	9,192	-46.1		24	9,553	-36.6		26	8,888	-49.9	
250	26	10,460	-55.3		27	10,255	-56.6		28	10,105	-53.8		26	10,392	-52.3		28	10,383	-52.9		24	10,793	-44.7		26	10,065	-54.5	
200	26	11,864	-60.1		27	11,655	-59.6		28	11,533	-54.7		25	11,810	-54.8		28	11,807	-55.9		22	12,242	-55.2		26	11,489	-55.0	
175	25	12,700	-58.7		27	12,491	-58.2		28	12,388	-53.4		25	12,662	-55.2		28	12,658	-55.1		22	13,084	-60.5		26	12,344	-53.7	
150	23	13,676	-58.3		26	13,469	-57.3		27	13,381	-53.6		23	13,634	-55.7		28	13,638	-56.7		21	14,035	-66.1		25	13,334	-53.7	
125	23	14,817	-60.3		25	14,616	-58.6		26	14,544	-55.0		22	14,790	-58.2		27	14,788	-59.5		21	15,126	-71.3		24	14,506	-55.3	
100	19	16,206	-63.4		24	16,009	-59.7		24	15,975	-56.5		22	16,185	-60.7		26	16,164	-62.5		15	16,425	-76.5		24	15,925	-56.2	
80	19	17,569	-65.3		21	17,403	-59.8		21	17,406	-56.6		20	17,559	-61.3		21	17,533	-63.2		13	17,694	-76.1		21	17,346	-56.6	
60	17	19,329	-63.0		18	19,198	-59.6		19	19,227	-57.8		16	19,356	-61.1		18	19,313	-61.3		9	19,365	-69.9		18	19,145	-58.7	
50	16	20,458	-61.9		14	20,356	-59.3		15	20,386	-57.2		13	20,494	-58.8		15	20,450	-59.6		7	20,477	-64.1		12	20,360	-57.2	
40	12	21,858	-59.5		13	21,759	-57.9		10	21,801	-58.1		9	21,880	-57.8		12	21,850	-57.3		5	21,874	-60.3		8	21,766	-59.0	
30	5	23,621	-60.3		10	23,587	-58.6		6	23,636	-57.7		6	23,711	-56.3													

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

FEBRUARY 1954

Standard pressure surface (mb.)	LAKE CHARLES, LA. (1017 MB.)				LANDER, WYO. (830 MB.)				LAS VEGAS, NEV. (942 MB.)				LITTLE ROCK, ARK. (1006 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	28	5	14.5	71	28	1,696	2.1	55	28	660	13.0	30	28	79	10.3	56
1,000	28	150	15.9	57	28	154			28	148			28	131	11.5	46
950	28	587	13.9	49	28				28	586			28	567	11.2	44
900	28	1,038	11.6	44	28	1,030			28	1,044	15.7	25	28	1,010	8.4	44
850	28	1,515	10.2	36	28	1,496			28	1,525	12.1	27	28	1,480	6.1	45
800	28	2,017	8.0	33	28	1,991	4.1	38	28	2,029	8.6	29	28	1,974	4.0	42
750	28	2,554	4.7	33	28	2,519	1.1	36	28	2,560	4.5	28	28	2,503	1.5	40
700	28	3,105	1.0		28	3,063	- 2.8	39	28	3,116	1.4		28	3,049	- 1.4	38
650	28	3,700	- 2.8		28	3,651	- 7.1	41	28	3,711	- 2.3		28	3,645	- 4.8	31
600	28	4,326	- 6.6		28	4,265	-11.0	39	28	4,339	- 6.9		28	4,260	- 8.4	30
550	27	5,002	-11.2		28	4,928	-15.1	35	28	5,016	-11.9		28	4,933	-12.8	
500	26	5,725	-16.3		28	5,641	-20.2	34	28	5,735	-17.0		28	5,648	-18.1	
450	26	6,517	-21.6		28	6,417	-26.2	36	28	6,522	-23.2		28	6,432	-23.8	
400	26	7,367	-28.0		28	7,252	-32.6		28	7,367	-29.9		27	7,276	-30.2	
350	26	8,311	-35.1		28	8,178	-39.8		28	8,302	-37.8		27	8,211	-37.5	
300	26	9,366	-43.3		28	9,212	-47.8		28	9,345	-46.1		27	9,256	-45.6	
250	26	10,569	-51.5		28	10,391	-55.9		26	10,535	-54.3		27	10,449	-53.0	
200	25	12,000	-56.1		28	11,792	-59.7		25	11,946	-59.5		27	11,872	-56.2	
175	25	12,846	-57.5		28	12,626	-59.1		24	12,789	-59.2		27	12,719	-56.7	
150	25	13,813	-59.9		27	13,596	-58.5		23	13,761	-59.1		27	13,691	-58.2	
125	25	14,941	-63.6		27	14,743	-58.4		22	14,891	-62.6		26	14,828	-60.4	
100	24	16,293	-67.8		25	16,140	-61.0		21	16,250	-66.1		25	16,205	-63.4	
80	23	17,629	-68.6		17	17,534	-60.7		19	17,590	-66.5		25	17,571	-64.2	
60	22	19,365	-65.6		16	19,325	-59.8		15	19,330	-64.0		18	19,324	-62.3	
50	21	20,480	-62.8		15	20,467	-58.9		15	20,455	-61.4		15	20,461	-60.4	
40	21	21,863	-59.7		12	21,365	-57.4		14	21,849	-59.4		10	21,858	-59.7	
30	13	23,662	-57.3		9	23,677	-55.0		9	23,666	-57.9					

Standard pressure surface (mb.)	MAZATLAN, MEXICO (1011 MB.)				MEDFORD, ORE. (973 MB.)				MERIDA, MEXICO (1015 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	27	14	22.5	79	28	401	7.3	79	28	27	22.8	72
1,000	27	112	21.8	73	28	175			28	153	22.1	71
950	27	571	23.7	32	28	604	9.9	59	28	599	19.9	66
900	27	1,030	21.7	30	28	1,049	9.2	46	28	1,062	17.5	59
850	27	1,522	18.6	31	28	1,520	6.7	46	28	1,548	14.7	58
800	27	2,039	14.9		28	2,015	3.9	45	28	2,058	11.7	55
750	27	2,588	10.8	40	28	2,543	1.2	45	28	2,599	9.1	48
700	26	3,150	6.3	45	28	3,090	- 1.6	40	28	3,165	6.2	37
650	25	3,755	2.0		28	3,679	- 5.1	38	26	3,776	3.0	
600	25	4,392	- 2.4		28	4,299	- 9.3	35	25	4,415	- .1	
550	24	5,079	- 6.6		28	4,968	-14.3	35	25	5,106	- 4.0	
500	24	5,816	-11.5		28	5,681	-19.3	38	25	5,852	- 8.7	
450	24	6,622	-17.0		28	6,464	-24.8	37	24	6,666	-14.4	
400	24	7,490	-23.2	46	28	7,302	-31.2		24	7,542	-20.9	
350	24	8,453	-30.3		28	8,233	-38.6		24	8,513	-28.5	
300	22	9,533	-38.5		28	9,274	-46.6		24	9,596	-37.0	
250	18	10,752	-48.0		28	10,459	-54.8		24	10,837	-44.7	
200	12	12,205	-56.6		27	11,867	-60.1		21	12,302	-53.9	
175	9	13,058	-59.7		27	12,699	-60.0		18	13,145	-59.3	
150	6	14,033	-63.2		26	13,671	-59.4		15	14,098	-65.0	
125					21	14,813	-61.1		10	15,188	-70.5	
100					17	16,188	-63.1		8	16,485	-75.4	
80					14	17,572	-64.1					
60					9	19,314	-59.4					
50					8	20,474	-59.3					
40												
30												

Standard pressure surface (mb.)	MIAMI, FLA. (1018 MB.)				MIDLAND, TEXAS (918 MB.)				NANTUCKET, MASS. (1011 MB.)				NASHVILLE, TENN. (995 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	28	4	18.9	76	28	871	12.3	34	28	14	1.3	82	28	177	8.3	65
1,000	28	156	18.6	73	28	138			28	105	2.7	75	28	134	3.7	
950	28	596	15.7	71	28	580			28	521	1.8	68	28	559	7.8	53
900	28	1,052	12.7	66	28	1,036	14.3	28	28	953	- .5	67	28	1,002	5.5	51
850	28	1,530	10.4	57	28	1,517	11.9	27	28	1,408	- 2.3	58	28	1,468	3.3	50
800	28	2,032	8.5	43	28	2,021	9.1	27	28	1,888	- 4.5	54	28	1,957	1.1	47
750	28	2,568	6.3	29	28	2,559	5.5	27	28	2,398	- 6.7	51	28	2,480	- .9	38
700	28	3,126	3.6		28	3,112	2.1		28	2,930	- 8.8	48	28	3,022	- 3.9	34
650	28	3,729	.4		28	3,710	- 1.9		28	3,505	-11.8	42	28	3,609	- 7.3	34
600	28	4,361	- 3.5		28	4,336	- 6.2		28	4,110	-15.1	39	28	4,223	-11.0	34
550	28	5,043	- 8.0		28	5,014	-11.2		28	4,766	-19.3		28	4,891	-15.0	33
500	28	5,777	-12.8		28	5,735	-16.6		28	5,464	-24.0		28	5,600	-19.8	36
450	28	6,578	-18.6		28	6,525	-22.6		28	6,228	-29.5	41	28	6,380	-25.5	34
400	28	7,442	-24.9		27	7,369	-29.1		28	7,054	-35.6		28	7,217	-31.5	
350	28	8,398	-31.7		27	8,308	-36.3		28	7,970	-41.9		28	8,148	-38.7	
300	27	9,466	-39.6		27	9,358	-44.2		28	8,998	-48.4		28	9,189	-46.0	
250	27	10,689	-47.1		27	10,556	-52.3		28	10,181	-53.2		28	10,381	-52.7	
200	27	12,144	-53.8		27	11,981	-56.6		28	11,612	-54.2		27	11,804	-55.7	
175	27	12,992	-58.1		27	12,827	-57.3		28	12,468	-53.9		27	12,654	-55.6	
150	27	13,951	-62.6		25	13,800	-59.3		28	13,455	-54.6		27	13,635	-56.6	
125	27	15,061	-67.2		24	14,933	-62.5		26	14,612	-55.7		26	14,783	-58.8	
100	25	16,390	-71.9		23	16,301	-65.7		26	16,024	-58.0		25	16,172	-60.8	
80	21	17,705	-72.9		21	17,647	-66.6		25	17,425	-59.3		21	17,561	-62.6	
60	18	19,407	-67.3		18	19,403	-62.6		21	19,244	-58.9		19	19,334	-61.6	
50	18	20,520	-62.1		14	20,536	-60.2		17	20,381	-58.5		17	20,453	-60.1	
40	10	21,877	-58.9		7	21,939	-58.6		14	21,801	-57.7		14	21,841	-58.5	
30	6	23,708	-54.9						9	23,605	-57.4					

Standard pressure surface (mb.)	NORTH PLATTE, NEBR. (915 MB.)				OAKLAND, CALIF. (1020 MB.)				OKLAHOMA CITY, OKLA. (970 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	28	848	3.3	61	28	6	11.7	75	28	391	9.7	49
1,000	28	116			28	168	13.2	62	28	133		
950	28	546			28	603	13.2	45	28	568	11.8	37
900	28	987	7.8	43	28	1,053	12.1	35	28	1,015	10.1	35
850	28	1,457	6.5	37	28	1,530	10.1		28	1,488	8.0	31
800	28	1,952	3.4	39	28	2,031	7.5		28	1,986	5.8	26
750	28	2,475	.3	40	28	2,563	4.1		28	2,520	2.8	27
700	28	3,021	- 3.4	41	28	3,117	.5		28	3,066	- .4	26
650	28	3,607	- 7.3	43	28	3,712	- 3.2		28	3,660	- 4.1	27
600	28	4,222	-11.5	44	28	4,335	- 7.4		28	4,281	- 8.2	28
550	28	4,886	-15.8	41	28	5,006	-12.3		28	4,954	-12.9	26
500	28	5,595	-20.6	38	28	5,728	-17.7		28	5,669	-18.2	
450	28	6,372	-26.4	41	28	6,514	-23.5		28	6,458	-24.3	
400	28	7,205	-32.9	42	28	7,357	-30.2		28	7,293	-30.9	
350	28	8,131	-40.2		28	8,291	-37.9		28	8,224	-38.2	
300	28	9,165	-48.2		28	9,333	-46.0		28	9,266	-45.3	
250	28	10,344	-55.7		28	10,521	-54.5		27	10,453	-52.9	
200	27	11,754	-58.4		28	11,932	-58.9		27	11,873	-57.5	
175	27	12,595	-57.6		28	12,768	-59.5		27	12,716	-57.2	
150	27	13,569	-57.3		28	13,730	-60.2		27	13,687	-58.1	
125	27	14,719	-58.7		27	14,853	-62.2		27	14,827	-60.8	
100	24	16,115	-59.6		25	16,224	-64.8		26	16,208	-63.6	
80	17	17,505	-60.2		23	17,579	-65.8		23	17,571	-64.2	
60	14	19,312	-60.0		21	19,335	-63.6		13	19,327	-62.2	
50	9	20,427	-58.9		20	20,462	-62.0		8	20,455	-61.0	
40					16	21,836	-60.0					
30					11	23,646	-58.3					

Standard pressure surface (mb.)	OMAHA, NEBR. (978 MB.)				PHOENIX, ARIZ. (977 MB.)				PITTSBURGH, PA. (970 MB.)				PORTLAND, ME. (1010 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	28	300	4.4	62	28	341	17.4	37	28	382	2.6	63	28	20	- 3.0	82
1,000	28	119			28	142			28	125			28	100	- 1.4	68
950	28	540	5.6	53	28	585	20.4		28	548	2.5	59	28	512	- 2.1	66
900	28	980	4.7	48	28	1,047	17.4		28	978	.3	61	28	937	- 3.2	68
850	28	1,445	3.1	40	28	1,531	13.8		28	1,434	- 2.1	60	28	1,387	- 4.7	61
800	28	1,934	.8	38	28	2,038	9.8		28	1,914	- 3.8	52	28	1,863	- 6.5	55
750	28	2,454	- 2.2	41	28	2,577	5.9		28	2,429	- 6.3	48	28	2,371	- 8.6	54
700	28	2,995	- 5.1	44	28	3,130	2.1		28	2,958	- 8.8	45	28	2,898	-11.1	55
650	28	3,578	- 8.5	44	28	3,728	- 1.7		28	3,538	-12.2	44	28	3,469	[illegible].9	55
600	28	4,190	-12.1	46	28	4,355	- 6.1		28	4,136	-15.7	47	28	4,069	-17.3	52
550	28	4,852	-16.2	44	28	5,031	-10.9		28	4,793	-19.6	46	27	4,710	-21.7	46
500	28	5,562	-21.1	41	28	5,755	-16.3		28	5,488	-23.9	46	27	5,405	-26.2	40
450	28	6,338	-26.8	43	27	6,545	-22.4		28	6,259	-29.0	46	26	6,153	-31.4	
400	28	7,169	-33.2	44	27	7,391	-28.9		27	7,087	-34.5	43	26	6,973	-37.1	
350	28	8,093	-40.4		27	8,330	-36.2		27	8,006	-41.2		26	7,885	-42.8	
300	28	9,126	-48.1		27	9,381	-44.0		27	9,037	-47.9		26	8,910	-48.8	
250	28	10,307	-54.9		27	10,581	-52.2		27	10,223	-52.6		26	10,092	-53.2	
200	28	11,718	-58.3		26	12,008	-57.7		26	11,650	-55.3		25	11,523	-53.5	
175	28	12,561	-56.5		25	12,848	-58.5		25	12,498	-53.4		24	12,371	-52.9	
150	27	13,538	-55.7		25	13,815	-59.3		24	13,493	-53.8		23	13,364	-53.6	
125	26	14,699	-57.1		24	14,945	-62.5		23	14,657	-55.9		20	14,534	-54.7	
100	26	16,104	-59.1		23	16,310	-66.1		21	16,059	-57.7		19	15,968	-56.0	
80	24	17,502	-60.3		23	17,656	-67.4		17	17,447	-58.1		18	17,379	-56.9	
60	23	19,297	-59.8		22	19,393	-64.3		14	19,287	-58.0		15	19,222	-57.8	
50	21	20,436	-59.9		22	20,514	-62.0		12	20,441	-58.5		15	20,372	-57.4	
40	14	21,859	-59.2		17	21,901	-59.3		8	21,861	-58.3		11	21,809	-56.4	
30					7	23,709	-58.2									

Standard pressure surface (mb.)	RAPID CITY, S. DAK. (903 MB.)				ST. CLOUD, MINN. (974 MB.)				SAN ANTONIO, TEX. (990 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	28	966	3.8	51	28	316	- 2.4	76	28	243	15.6	43
1,000	28	121			28	106			28	152		
950	28	548			28	519	- 1.5	66	28	587	16.8	38
900	28	992	5.7	44	28	947	- 1.0	53	28	1,049	13.7	40
850	28	1,461	4.7	43	28	1,402	- 1.6	44	28	1,528	11.4	36
800	28	1,952	1.7	45	28	1,883	- 3.6	43	28	2,032	9.0	33
750	28	2,474	- 1.8	47	28	2,396	- 6.2	44	28	2,568	6.2	31
700	28	3,014	- 5.2	48	28	2,926	- 9.7	43	28	3,125	2.9	30
650	28	3,595	- 9.0	47	28	3,501	-13.2	42	27	3,719	- .8	
600	28	4,207	-13.1	49	28	4,100	-16.4	43	27	4,355	- 5.1	
550	28	4,866	-17.8	48	28	4,755	-20.2	46	27	5,029	- 9.7	
500	28	5,570	-22.5	45	28	5,450	-24.6	46	27	5,761	-14.8	
450	28	6,339	-27.8	41	28	6,215	-29.6	45	27	6,554	-20.6	
400	28	7,171	-34.1	42	28	7,039	-35.6	50	27	7,411	-27.3	
350	28	8,093	-40.9		28	7,954	-42.6		27	8,356	-35.0	
300	28	9,123	-48.6		28	8,978	-49.6		27	9,413	-43.0	
250	28	10,303	-55.1		28	10,156	-54.4		27	10,618	-51.4	
200	28	11,715	-58.2		28	11,578	-56.1		27	12,047	-56.6	
175	28	12,555	-58.1		27	12,426	-54.4		27	12,891	-58.3	
150	28	13,529	-56.7		27	13,413	-54.0		27	13,855	-60.5	
125	28	14,683	-57.6		27	14,580	-54.9		27	14,981	-64.3	
100	26	16,086	-59.0		27	16,000	-56.6		24	16,325	-68.1	
80	23	17,486	-60.3		26	17,406	-57.5		18	17,644	-68.6	
60	18	19,276	-58.2		19	19,240	-57.2		13	19,377	-64.2	
50	13	20,427	-58.5		17	20,409	-57.0		13	20,499	-61.6	
40	8	21,850	-57.8		6	21,821	-55.9		10	21,883	-60.1	
30									8	23,694	-56.4	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

FEBRUARY 1954

Standard pressure surface (mb.)	SAN JUAN, P. R. (1014 MB.)				SANTA MARIA, CALIF. (1010 MB.)				S. STE. MARIE, MICH. (986 MB.)				SPOKANE, WASH. (934 MB.)				SWAN ISLAND, W. I. (1015 MB.)				TACUBAYA, MEXICO (774 MB.)				TAMPA, FLA. (1018 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	28	19	22.7	85	28	71	12.4	76	28	221	- 4.2	88	28	722	0.8	80	21	10	24.1	76	20	2,306	14.8	53	28	7	15.6	78
1,000--	28	148	22.6	80	28	159	15.0	61	28	106			28	168			21	138	23.8	73	20	75			28	161	16.7	69
950----	28	599	20.0	79	28	598	16.2	42	28	515	- 4.1	68	28	586			21	586	20.1	77	20	534			28	600	14.7	61
900----	28	1,059	17.1	79	28	1,052	14.4	33	28	935	- 6.2	69	28	1,022	2.3	66	21	1,050	17.0	74	20	1,012			28	1,052	12.0	57
850----	28	1,546	14.1	76	28	1,532	11.3		28	1,381	- 7.8	65	28	1,483	1.8	54	21	1,536	14.2	67	20	1,502			28	1,528	9.5	47
800----	28	2,056	11.8	66	28	2,035	8.6		28	1,850	- 9.5	60	28	1,970	- .3	48	21	2,046	12.4	57	20	2,032			28	2,029	7.1	38
750----	28	2,600	9.3	62	28	2,573	5.2		28	2,352	-11.5	60	28	2,487	- 3.1	49	21	2,594	9.7	48	20	2,582	13.1	47	28	2,566	5.0	
700----	28	3,165	6.9	52	28	3,124	1.7		28	2,873	-13.6	55	28	3,026	- 6.5	50	21	3,154	6.7		20	3,149	8.5	53	28	3,117	2.2	
650----	28	3,778	3.4	45	28	3,723	- 2.0		28	3,438	-16.8	54	28	3,608	- 9.6	49	21	3,767	4.1		20	3,765	3.5	62	28	3,717	- 1.3	
600----	28	4,415	- .4	43	28	4,348	- 6.4		28	4,030	-20.2	51	28	4,215	-13.5	49	21	4,406	.7		20	4,401	- 1.1	67	28	4,345	- 5.1	
550----	28	5,106	- 4.6	41	27	5,019	-11.6		28	4,672	-23.8	51	28	4,873	-17.8	50	20	5,103	- 2.9		20	5,094	- 5.8	66	28	5,024	- 9.3	
500----	28	5,849	- 9.4		27	5,742	-17.1		28	5,359	-28.1	49	28	5,577	-22.2	52	20	5,851	- 7.7		20	5,831	-10.4	58	28	5,753	-14.4	
450----	28	6,673	-14.6		27	6,527	-23.0		28	6,114	-32.9		28	6,348	-27.7	52	20	6,670	-13.5		20	6,645	-15.3		28	6,550	-20.1	
400----	28	7,539	-20.8		27	7,375	-29.6		28	6,928	-38.1		28	7,178	-33.7	51	20	7,547	-20.3		20	7,516	-21.4		28	7,405	-26.4	
350----	28	8,512	-27.6		27	8,312	-37.5		27	7,834	-44.3		28	8,099	-41.1		20	8,520	-27.3		18	8,487	-29.0		28	8,355	-33.6	
300----	28	9,604	-34.6		27	9,356	-45.8		27	8,851	-50.5		27	9,129	-49.0		20	9,614	-34.0		15	9,570	-37.4		28	9,418	-41.5	
250----	28	10,855	-43.0		26	10,546	-53.5		26	10,030	-54.1		27	10,302	-56.6		20	10,867	-42.7		11	10,816	-46.5		28	10,631	-49.0	
200----	28	12,324	-53.8		26	11,964	-58.1		26	11,460	-53.5		27	11,706	-58.6		19	12,341	-53.2		7	12,275	-54.9		28	12,079	-53.9	
175----	28	13,170	-59.6		26	12,802	-59.3		25	12,318	-53.4		27	12,547	-57.4		19	13,189	-59.2		5	13,149	-58.2		28	12,929	-57.1	
150----	28	14,119	-65.7		26	13,765	-60.0		19	13,301	-52.9		27	13,521	-57.0		19	14,138	-65.6						28	13,896	-60.5	
125----	28	15,209	-72.0		25	14,904	-62.9		7	14,476	-53.7		25	14,677	-58.3		18	15,228	-72.3						28	15,017	-65.3	
100----	27	16,503	-77.2		23	16,263	-65.6						22	16,063	-59.5		16	16,519	-77.5						26	16,361	-69.3	
80-----	23	17,782	-79.1		22	17,517	-66.7						20	17,457	-60.2		14	17,789	-78.6						25	17,682	-70.1	
60-----	19	19,440	-70.2		19	19,360	-63.4						13	19,309	-60.2		13	19,464	-68.8						23	19,407	-66.4	
50-----	19	20,537	-65.2		17	20,495	-61.5						10	20,458	-57.7		13	20,568	-63.8						22	20,522	-61.4	
40-----	18	21,912	-60.4		15	21,888	-59.4										13	21,949	-59.1						19	21,914	-58.2	
30-----	12	23,713	-57.1		10	23,689	-57.9										12	23,772	-55.4						14	23,748	-55.1	
20-----																	8	26,386	-50.3									

Standard pressure surface (mb.)	TATOOSH ISLAND, WASH. (1012 MB.)				VERACRUZ, MEXICO (1014 MB.)				WASHINGTON, D. C. (1005 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	28	31	6.6	87	27	13	22.7	78	28	88	4.6	59
1,000--	28	129	7.2	79	27	136	21.7	78	28	131	5.2	53
950----	28	556	5.2	77	27	579	19.8	66	28	556	4.0	55
900----	28	989	3.0	73	27	1,046	17.9	57	28	987	1.4	56
850----	28	1,450	.9	67	27	1,533	15.2	53	28	1,445	- 1.0	56
800----	28	1,936	- 1.2	66	27	2,044	12.4	51	28	1,927	- 3.2	49
750----	28	2,454	- 3.6	59	27	2,586	9.5	46	28	2,446	- 5.6	50
700----	28	2,991	- 6.2	55	26	3,155	6.7	41	28	2,974	- 8.0	48
650----	28	3,574	- 9.6	58	26	3,760	3.6	35	28	3,555	-11.0	46
600----	27	4,184	-13.3	55	26	4,406	- .3	40	27	4,151	-14.4	
550----	27	4,842	-17.6	53	25	5,096	- 4.3	35	27	4,812	-18.3	
500----	27	5,548	-22.3	52	23	5,842	- 9.4		27	5,511	-22.9	
450----	27	6,321	-27.5	48	23	6,655	-14.9		27	6,286	-28.4	
400----	27	7,151	-33.2	42	21	7,529	-21.1		27	7,109	-34.5	
350----	27	8,075	-40.2		19	8,500	-28.6		27	8,028	-41.4	
300----	27	9,109	-47.8		17	9,587	-36.7		27	9,058	-48.0	
250----	26	10,287	-55.7		14	10,828	-44.4		27	10,244	-53.0	
200----	26	11,695	-58.4		14	12,292	-54.6		27	11,671	-55.5	
175----	25	12,545	-57.5		12	13,127	-60.7		27	12,524	-54.4	
150----	22	13,524	-55.4		10	14,084	-65.8		27	13,509	-55.9	
125----	22	14,684	-56.7		9	15,183	-72.0		27	14,663	-57.3	
100----	21	16,083	-59.7						26	16,056	-60.2	
80-----	18	17,463	-59.2						25	17,448	-60.9	
60-----	15	19,264	-58.0						23	19,247	-60.7	
50-----	8	20,454	-59.7						21	20,387	-59.8	
40-----	7	21,837	-58.6						19	21,795	-58.9	
30-----									14	23,603	-58.2	

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T., "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Table 21

FEBRUARY 1954

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface----------	26	282	2.7	28	285	2.4	27	277	5.1	27	304	3.8	27	334	0.9	28	109	1.8
500--------------	--	---	----	--	---	----	--	---	----	--	---	----	--	---	----	27	129	1.8
1,000------------	26	283	3.6	--	---	----	--	---	----	27	301	5.5	27	268	.5	25	232	1.5
1,500------------	25	287	4.3	--	---	----	27	277	9.4	24	307	8.3	26	217	1.8	22	289	3.3
2,000------------	23	283	5.6	28	279	3.1	26	285	10.7	22	300	11.6	26	252	3.6	19	293	5.6
2,500------------	22	289	7.4	28	294	4.4	24	290	12.2	20	301	12.1	24	273	6.0	19	278	6.6
3,000------------	22	289	7.8	27	298	6.4	21	296	13.0	17	307	13.7	20	289	8.9	18	275	7.1
4,000------------	21	285	10.4	26	304	9.0	17	296	12.5	14	304	16.9	16	290	10.7	16	282	8.7
5,000------------	20	293	11.3	25	310	10.8	12	295	15.0	14	299	19.2	15	287	12.4	15	286	13.9
6,000------------	19	299	11.6	24	308	11.7	11	296	17.2	11	293	18.0	14	295	14.5	13	277	14.6
8,000------------	12	289	16.9	22	308	10.6							10	313	15.7			
10,000-----------				20	307	10.6												
12,000-----------				10	305	8.6												

Altitude (meters) m.s.l.	Buffalo, N.Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S.C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)			Ely, Nev. (1,910 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface----------	24	226	3.5	25	217	2.2	28	226	2.9	27	223	3.1	28	284	1.9	27	244	1.0
500--------------	24	234	5.6	25	225	4.8	28	235	3.9	27	235	4.1	--	---	----	--	---	----
1,000------------	18	240	6.2	21	255	5.9	28	246	5.2	27	246	6.0	--	---	----	--	---	----
1,500------------	11	233	7.3	14	259	5.8	24	271	7.5	21	268	7.4	28	282	2.3	--	---	----
2,000------------				11	271	5.5	22	283	10.6	18	280	9.7	28	281	2.9	27	247	1.2
2,500------------				10	280	6.3	22	285	12.1	17	287	12.2	27	281	3.8	27	264	1.7
3,000------------				10	292	6.8	22	282	14.3	16	293	13.2	27	282	5.7	26	275	2.3
4,000------------				10	282	9.5	18	284	16.0	12	302	17.7	24	288	5.8	24	321	4.6
5,000------------							14	277	16.8	11	309	21.6	24	289	9.3	21	317	7.4
6,000------------							13	275	19.5	10	310	23.9	22	289	10.0	19	325	8.0
8,000------------													19	281	10.8	17	321	8.0
10,000-----------													15	276	17.6	16	334	8.1
12,000-----------													12	268	21.9	13	355	11.0

Altitude (meters) m.s.l.	Grand Junction, Colo. (1,475 m.)			Green Bay, Wis. (210 m.)			Greensboro, N.C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Little Rock, Ark. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface----------	28	289	2.2	26	288	1.6	27	247	2.4	28	264	4.8	28	235	0.7	27	245	2.5
500--------------	--	---	----	26	296	3.2	27	241	3.4	--	---	----	27	237	4.0	27	264	3.5
1,000------------	--	---	----	26	303	5.9	27	244	4.7	28	264	8.2	25	247	6.2	25	267	5.5
1,500------------	28	288	2.2	20	297	7.5	25	256	7.2	27	273	9.9	23	265	7.9	22	286	7.1
2,000------------	28	275	2.9	19	298	8.8	24	263	10.1	25	278	10.8	20	276	9.1	19	300	9.8
2,500------------	27	266	3.2	17	306	10.0	23	271	11.0	23	280	13.2	18	281	11.3	18	299	11.5
3,000------------	27	281	3.9	16	306	11.1	20	282	13.5	21	291	14.4	16	278	11.1	17	301	12.8
4,000------------	26	308	8.4	13	299	14.6	18	280	18.2	14	299	15.1	16	277	14.1	13	302	16.4
5,000------------	23	322	10.7	10	303	14.0	16	281	19.0				13	289	17.0	12	300	18.8
6,000------------	21	319	11.3				12	277	18.8				11	282	19.1			
8,000------------	17	329	11.0															
10,000-----------	16	321	14.1															

Altitude (meters) m.s.l.	Medford, Ore. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			Oakland, Calif. (8 m.)			Omaha, Nebr. (306 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface----------	27	135	0.1	28	143	1.1	22	274	2.4	27	238	2.5	28	244	2.2	26	302	2.5
500--------------	27	138	.2	28	154	1.4	21	271	3.1	27	238	4.0	28	17	.9	26	299	2.2
1,000------------	27	162	1.5	27	255	2.5	20	288	4.5	24	238	5.4	26	333	1.9	25	299	3.6
1,500------------	25	201	2.4	25	272	5.6	16	303	6.8	22	262	7.0	25	310	2.0	24	307	7.0
2,000------------	24	214	3.5	23	270	7.3	16	308	8.6	17	298	9.3	24	323	2.0	23	304	8.6
2,500------------	21	245	4.7	22	270	7.5	14	307	10.6	17	296	11.1	24	311	2.2	21	304	11.1
3,000------------	20	265	5.1	22	279	8.4	14	299	12.0	16	301	14.6	24	298	2.6	19	305	12.9
4,000------------	16	273	6.9	20	267	10.9				16	299	18.2	22	326	2.4	17	307	15.7
5,000------------	15	265	7.9	20	265	14.4				13	300	19.4	20	326	2.0	15	306	18.3
6,000------------	14	251	8.6	16	265	18.6				11	305	21.0	18	29	1.8	15	314	22.4
8,000------------	14	246	8.9	12	274	25.8							16	319	3.1	11	312	28.6
10,000-----------	11	278	10.3										11	197	2.2			

Altitude (meters) m.s.l.	Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface----------	28	63	0.4	27	320	4.2	27	279	1.7	26	265	2.0	28	302	2.0
500--------------	28	80	.7	--	---	----	27	285	2.7	26	259	3.0	28	303	2.5
1,000------------	27	88	1.4	27	318	4.4	24	295	4.5	22	256	4.2	27	296	3.0
1,500------------	27	106	1.5	27	313	8.0	23	304	7.8	19	284	6.7	26	293	4.6
2,000------------	27	69	1.3	26	304	9.6	22	301	10.2	19	289	8.8	24	289	6.6
2,500------------	27	12	1.3	24	303	11.3	22	305	11.6	17	302	11.7	24	287	8.0
3,000------------	27	346	2.4	21	302	13.6	20	301	13.9	15	297	13.1	24	288	9.2
4,000------------	25	318	3.5	17	307	17.0	17	308	16.1	10	310	18.2	20	286	12.9
5,000------------	25	303	4.9	15	315	18.1	14	316	18.1	10	307	20.3	20	285	14.3
6,000------------	23	312	5.1	11	318	19.8	14	306	21.1				18	290	14.3
8,000------------	20	301	6.6				12	310	24.1						
10,000-----------	12	308	1.7												
12,000-----------															
14,000-----------															
16,000-----------															

Altitude (meters) m.s.l.	San Diego, Calif. (13 m.)			* Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (725 m.)			† Washington, D.C. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface----------	28	283	2.3	28	286	1.4	23	223	4.1	28	237	2.5
500--------------	28	296	.9	28	278	2.5	--	---	----	28	255	4.7
1,000------------	25	71	1.9	28	292	4.9	23	221	7.5	28	256	6.8
1,500------------	24	61	3.1	28	289	5.7	21	234	12.8	28	264	8.6
2,000------------	23	55	3.9	28	290	7.2	18	247	11.0	28	269	11.1
2,500------------	23	64	3.3	28	288	8.1	13	263	8.9	28	272	13.3
3,000------------	23	60	2.0	28	286	9.0	10	275	9.5	27	268	14.9
4,000------------	21	38	3.2	28	284	11.7				27	270	17.1
5,000------------	19	8	4.2	28	283	13.5				27	271	20.0
6,000------------	18	8	4.7	28	280	15.8				27	271	23.0
8,000------------	16	354	2.5	28	282	22.0				27	270	24.0
10,000-----------	14	291	3.0	28	288	26.5				27	272	29.8
12,000-----------	12	285	7.7	27	288	21.8				26	268	29.2
14,000-----------	10	298	12.0	26	284	18.9				26	271	29.4
16,000-----------				22	289	18.2				24	270	21.7

* Rawin Data (Cont'd)
18,000 m., 16 obs. 288 dir., 14.9 speed
20,000 m., 10 obs. 289 dir., 9.6 speed

† Rawin Data (Cont'd)
18,000 m., 23 obs. 269 dir., 16.4 speed
20,000 m., 21 obs. 267 dir., 6.2 speed
22,000 m., 15 obs. 282 dir., 9.3 speed

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second

RAWIN DATA

Average monthly resultant winds

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S. C. (13 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	28	17	0.7	28	302	2.3	28	119	3.1	28	263	1.5	28	276	1.4	28	218	1.3
500	--	---	----	--	---	----	28	149	3.0	28	241	3.0	27	265	2.5	28	240	4.9
1,000	--	---	----	28	312	8.0	28	180	1.0	28	263	3.6	27	261	3.5	26	254	6.7
1,500	--	---	----	28	317	10.1	28	286	2.2	28	276	4.5	24	276	4.8	26	268	7.3
2,000	28	300	4.7	28	311	12.2	28	295	3.7	26	280	6.1	25	274	5.0	24	271	9.6
2,500	28	308	6.4	27	312	13.7	28	299	5.7	26	273	7.2	25	268	6.5	25	273	10.8
3,000	28	308	8.0	26	308	16.0	28	288	6.7	26	268	8.4	24	261	7.1	26	275	11.4
4,000	28	308	8.7	22	304	17.9	28	290	10.0	25	281	10.8	23	262	8.6	25	269	15.5
5,000	27	321	10.3	16	288	17.4	26	284	12.3	25	284	12.2	23	246	9.9	24	275	15.8
6,000	25	310	10.3	14	284	16.9	25	285	14.4	25	280	15.6	22	241	12.9	22	270	18.4
3,000	21	305	7.9				16	270	22.1	23	278	21.9	16	227	15.2	19	277	18.0
10,000	16	313	5.7				10	268	27.0	15	280	26.8	11	266	16.7			
12,000	13	310	8.3										11	264	18.4			
14,000	11	306	12.0										11	263	17.2			
16,000	10	320	14.7										10	264	12.6			
18,000																		
20,000																		

Altitude (meters) m.s.l.	Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N. C. (275 m.)			Hatteras, N. C. (3 m.)			Int. Falls, Minn. (358 m.)			Little Rock, Ark. (80 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	28	270	1.1	28	344	0.4	28	274	0.8	28	282	1.3	28	240	1.5	28	224	1.4
500	28	274	2.8	--	---	----	28	262	3.3	26	281	4.5	28	257	2.8	28	254	4.2
1,000	28	278	5.7	--	---	----	28	266	6.2	26	270	6.9	28	292	5.6	28	270	6.3
1,500	28	290	7.5	27	336	.5	28	263	8.3	26	275	8.3	28	311	7.0	28	277	7.3
2,000	28	295	8.5	27	302	2.2	27	266	9.8	26	276	10.0	26	302	8.0	26	283	9.2
2,500	28	302	10.5	27	283	2.8	27	273	11.4	26	275	11.8	26	302	10.1	24	290	10.2
3,000	28	306	12.1	27	292	4.6	26	277	11.6	26	280	13.3	25	308	10.1	24	301	11.4
4,000	28	302	15.2	28	311	8.8	24	280	15.8	25	273	17.8	25	305	11.9	20	301	13.6
5,000	27	297	18.1	26	324	12.6	22	279	18.7	22	268	18.7	22	309	15.4	17	292	14.3
6,000	27	298	20.8	23	318	13.2	16	273	17.7	16	265	17.0	21	306	15.5	14	299	13.8
3,000	27	301	25.5	16	307	14.1	12	253	16.0	13	262	18.4	11	272	17.7			
10,000	27	303	27.6	10	347	14.0	11	253	21.8									
12,000	27	292	27.2															
14,000	25	280	24.6															
16,000	24	284	18.8															
18,000	21	288	9.8															
20,000	13	292	8.7															

Altitude (meters) m.s.l.	Medford, Ore. (401 m.)			Miami, Fla. (12 m.)			Midland, Tex. (871 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	28	148	0.9	28	80	0.4	27	200	1.3	27	292	2.1	28	243	1.6	28	227	0.5
500	28	148	1.0	28	158	.5	--	---	----	26	275	7.3	28	243	5.3	26	5	.9
1,000	27	177	2.0	28	295	.7	27	218	2.5	26	275	8.4	26	244	6.2	26	322	2.1
1,500	27	209	3.3	28	264	2.5	27	258	4.9	23	270	9.4	24	270	7.6	26	296	2.2
2,000	28	223	4.9	28	268	3.5	27	278	6.0	23	269	9.5	25	285	9.8	28	281	2.4
2,500	27	252	6.2	28	275	5.3	27	284	7.3	23	264	11.6	23	291	10.8	28	282	2.6
3,000	27	266	7.7	28	272	6.1	27	293	7.8	23	263	13.2	24	285	13.6	28	267	3.4
4,000	27	266	9.6	28	272	9.9	27	291	9.9	21	251	13.3	23	288	15.9	28	255	4.7
5,000	26	256	12.2	27	270	12.5	27	283	12.1	16	264	13.5	19	283	16.4	27	269	5.0
6,000	23	256	12.3	27	274	15.9	26	285	12.4	14	256	14.6	17	285	17.0	26	274	5.4
8,000	20	257	14.1	24	277	23.6	22	277	12.9	10	291	17.1				24	289	5.4
10,000	17	264	12.2	16	274	28.8	21	273	18.2							20	328	1.0
12,000	12	281	11.0	10	282	35.6	14	276	24.7							18	308	9.1
14,000							11	279	19.0							11	302	10.4
16,000							10	281	17.2									
18,000																		
20,000																		
22,000																		

Altitude (meters) m.s.l.	Oklahoma, City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			St. Cloud, Minn. (318 m.)			San Antonio, Tex. (242 m.)			San. Juan, P. R. (28 m.)			Santa Maria, Calif. (72 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	28	3	0.8	28	318	3.0	28	318	1.2	28	24	0.8	28	142	2.4	28	77	0.5
500	24	1	1.8	--	---	----	28	308	2.1	28	81	.6	28	109	5.7	26	31	1.2
1,000	24	325	4.4	28	316	3.4	28	310	4.3	28	290	2.2	28	110	5.9	26	13	1.3
1,500	24	316	6.7	28	313	10.3	28	309	6.8	28	287	4.5	28	109	5.4	27	24	1.1
2,000	24	312	8.1	28	312	12.6	28	315	8.4	28	286	7.1	28	108	5.1	27	313	.8
2,500	23	295	8.6	28	319	14.0	27	314	9.5	27	284	7.7	28	116	4.0	27	289	.7
3,000	23	305	9.3	27	312	14.3	27	308	10.5	27	281	8.9	28	108	2.3	26	321	1.3
4,000	24	299	10.3	26	309	15.1	24	298	12.3	26	280	10.9	28	265	2.1	27	301	2.9
5,000	24	292	12.1	20	306	17.8	22	304	14.7	25	284	11.7	28	269	4.7	24	324	2.6
6,000	24	289	13.1	15	286	19.2	22	294	18.2	25	284	13.7	28	269	7.0	24	324	2.6
8,000	22	286	16.8				14	272	16.4	23	272	19.4	28	280	13.3	23	342	1.7
10,000	18	281	17.7				12	267	18.9	19	273	28.2	28	273	26.8	21	288	2.9
12,000	13	279	20.1							15	267	35.8	28	268	32.0	20	302	9.5
14,000													23	278	24.5	20	280	11.2
16,000													22	285	15.6	19	281	9.1
18,000													16	278	6.1	17	302	4.8
20,000													15	128	2.2	15	358	3.9
22,000													13	188	1.7	13	323	3.6

Altitude (meters) m.s.l.	Sault. Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is. Wash. (33 m.)			Washington, D. C. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	27	15	0.8	28	207	2.6	26	179	3.9	28	241	1.5
500	27	269	1.9	--	---	----	25	221	5.9	28	263	6.4
1,000	27	274	4.1	27	216	7.3	24	240	7.2	28	274	10.1
1,500	27	290	6.1	26	235	9.8	23	247	8.9	28	282	9.9
2,000	27	290	6.9	26	240	11.0	23	250	11.0	28	288	10.6
2,500	27	292	7.3	25	254	11.6	23	256	14.0	28	289	12.4
3,000	27	291	9.6	23	263	12.3	21	267	15.7	28	286	13.9
4,000	27	291	10.8	22	269	14.5	20	271	18.6	28	276	16.1
5,000	27	283	14.2	18	280	17.7	16	267	20.2	27	280	19.6
6,000	27	286	16.9	13	282	17.8	15	264	22.0	27	275	23.1
8,000	26	285	21.9							26	270	27.4
10,000	25	282	24.[illegible]							25	266	29.5
12,000	23	290	24.6							25	266	30.9
14,000	11	296	21.4							25	267	29.5
16,000										25	270	21.8
18,000										23	270	17.4
20,000										19	273	12.2
22,000										17	284	7.5

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following table 22 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun. FEBRUARY 1954

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
	ALBUQUERQUE, N. MEX.								
	Air mass								
	4.08	3.26	2.44	1.63	*1.0	1.63	2.44	3.26	4.00
Feb.									
1	0.89	1.00	1.14	1.31	----	1.31	1.16	1.06	0.94
2	.99	1.10	1.20	1.38	----	1.35	1.21	1.10	.98
3	1.04	1.12	1.26	1.39	----	----	1.22	1.04	.96
4	1.04	1.14	1.26	1.34	----	1.37	1.20	1.06	.97
5	1.02	1.12	1.25	1.35	----	1.40	1.31	1.22	1.15
7	----	1.12	1.24	1.40	----	1.32	1.20	1.34	1.06
8	1.00	1.12	1.25	1.40	----	1.38	1.26	1.14	1.12
9	----	----	----	----	----	1.44	1.31	1.25	1.19
10	.88	1.00	1.14	1.34	----	1.38	1.22	1.13	1.10
11	.99	1.11	1.21	1.38	----	1.30	1.21	1.08	.98
13	.99	----	----	1.38	----	----	1.16	1.04	----
15	----	----	----	----	----	----	1.22	1.14	1.05
17	.97	1.07	1.19	1.36	----	1.37	1.21	1.12	.98
18	.00	1.01	1.16	1.35	----	----	----	----	----
19	----	.75	.87	.80	----	.70	.67	.63	.39
20	.93	1.03	1.13	1.29	----	1.29	1.11	1.04	.94
21	.94	1.04	1.16	1.29	----	1.27	1.13	1.03	.95
22	.92	1.01	1.11	1.26	----	----	----	----	----
23	----	----	----	----	----	----	1.13	1.03	.90
24	.63	.77	.87	1.12	----	1.26	1.15	1.06	.97
25	.92	1.03	1.12	1.26	----	1.25	1.08	1.00	.91
26	.92	1.02	----	----	----	----	----	----	----
27	.61	.65	.82	.96	----	1.11	.02	.67	.47
20	.99	1.10	1.20	1.24	----	1.43	1.30	1.19	1.00
Averages	.92	1.02	1.14	1.29	----	1.30	1.16	1.07	.95
Departures	-.05	-.05	-.04	-.04	----	-.02	-.05	-.03	-.08
	TABLE MOUNTAIN, CALIF.								
	Air mass								
	3.76	3.01	2.26	1.51	*1.0	1.51	2.26	3.01	3.76
Feb.									
1	----	----	----	1.47	----	----	----	----	----
2	----	----	----	1.47	----	----	----	----	----
3	----	----	----	1.50	----	----	----	----	----
4	----	----	----	1.48	----	----	----	----	----
6	----	----	----	1.49	----	----	----	----	----
7	----	----	----	1.49	----	----	----	----	----
10	----	----	----	1.49	----	----	----	----	----
23	----	----	----	1.48	----	----	----	----	----
24	----	----	----	1.49	----	----	----	----	----
25	----	----	----	1.49	----	----	----	----	----
Averages	----	----	----	1.49	----	----	----	----	----
Departures	----	----	----	-.02	----	----	----	----	----
	BOSTON, MASS.								
	Air mass								
	4.96	3.96	2.97	1.98	*0.99	1.90	2.97	3.96	4.96
	NO DATA DURING FEBRUARY 1954								

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
	BLUE HILL, MASS.								
	Air mass								
	4.86	3.89	2.92	1.94	*1.0	1.94	2.92	3.89	4.86
Feb.									
1	0.95	1.07	1.19	1.35	----	----	----	----	----
6	----	----	----	----	----	0.95	0.81	----	----
7	----	----	----	----	----	----	1.15	1.04	0.96
10	.85	.95	1.09	----	----	----	----	----	----
12	----	.99	1.15	1.37	----	1.36	1.19	1.03	.95
13	.94	1.06	1.20	1.37	----	----	----	----	----
19	.94	1.06	1.18	1.37	----	1.29	1.05	.96	.83
20	.84	.96	1.10	1.33	----	1.32	1.16	1.07	.89
23	----	----	----	1.09	----	1.18	1.03	.95	.89
Averages	.90	1.02	1.15	1.31	----	1.22	1.07	1.01	.92
Departures	+.01	+.03	+.04	+.01	----	-.08	-.07	.00	+.02
	LINCOLN, NEBR.								
	Air mass								
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77
Feb.									
4	0.92	1.01	1.14	1.29	----	1.29	1.14	1.03	0.92
8	----	----	----	----	----	1.28	1.12	1.01	.92
9	.90	1.03	1.14	1.31	----	1.31	1.17	1.01	.84
10	.89	1.00	1.11	1.27	1.42	1.29	1.14	1.03	.92
11	.94	1.02	1.13	1.27	1.41	1.27	1.04	.92	.81
13	----	.81	.96	1.16	1.32	----	----	----	----
16	----	.87	1.04	1.24	1.39	1.22	1.07	.94	.79
17	----	----	----	----	----	1.03	.83	.60	.52
18	.68	.79	.92	1.07	1.26	----	----	----	----
24	.79	.90	1.05	1.22	1.37	1.22	1.07	.92	.79
Averages	.85	.93	1.06	1.23	1.36	1.24	1.07	.94	.81
Departures	-.04	-.07	-.09	-.11	-.10	-.00	-.12	-.06	-.09
	MADISON, WIS.								
	Air mass								
	4.81	3.84	2.08	1.92	*0.96	1.92	2.80	3.84	4.81
	NO DATA DURING FEBRUARY 1954								

*Extrapolated

Langley is the unit used to denote one gram calorie per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

Table 31a Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	5	6	7	8	9	10	11		12	13	14	15	16	17	18		19	20	21	22	23	24	25	
Langleys	52	59	64	59	57	59	63	59	63	62	39	52	59	18	61	51	55	63	73	55	58	69	32	58
Date	26	27	28	1	2	3	4																	
Langleys	69	51	86	64	69	76	68	69																

Table 31b Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	5	6	7	8	9	10	11		12	13	14	15	16	17	18		19	20	21	22	23	24	25	
Langleys	61	197	188	66	64	233	156	138	250	260	27	53	95	21	59	109	252	251	161	44	235	251	27	175
Date	26	27	28	1	2	3	4																	
Langleys	190	47	152	60	247	271	289	180																

Table 31c Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	5	6	7	8	9	10	11		12	13	14	15	16	17	18		19	20	21	22	23	24	25	
Langleys	217	422	499	151	100	319	214	275	628	531	11	83	145	12	254	238	536	538	258	56	495	421	40	335
Date	26	27	28	1	2	3	4																	
Langleys	362	49	332	53	513	269	507	298																

Table 31d Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	5	6	7	8	9	10	11		12	13	14	15	16	17	18		19	20	21	22	23	24	25	
Langleys	121	116	236	83	78	85	73	113	256	208	31	69	75	21	237	128	240	248	105	60	246	171	68	162
Date	26	27	28	1	2	3	4																	
Langleys	125	50	219	64	261	93	212	146																

Table 31e Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	5	6	7	8	9	10	11		12	13	14	15	16	17	18		19	20	21	22	23	24	25	
Langleys	118	80	90	116	116	94	118	105	54	56	45	105	112	25	130	75	40	58	136	89	49	96	36	72
Date	26	27	28	1	2	3	4																	
Langleys	101	86	150	82	63	133	72	98																

Note. Langley is the unit used to denote one gram calorie per square centimeter.

SOLAR RADIATION DATA

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.

FEBRUARY 1954

1954	Aklavik, Mackenzie	Albuquerque, N.Mex.	Astoria, Oreg.	Atlanta, Ga.	Barrow, Alaska	Bethel, Alaska	Bismark, N. Dak.	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Tex.	Canton Island, Pacific Area	Caribou, Me.	Charleston, S. C.	Columbia, Mo.	Columbus, Ohio	Davis, Calif.	Dodge City, Kans.	E. Lansing, Mich.	E. Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Ely, Nev.	Fairbanks, Alaska	Fort Worth, Tex.	Fresno, Calif.	Grand Junction, Colo.	Great Falls, Mont.	Greensboro, N. C.	Griffin, Ga.	Hatteras, N. C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.	Lake Charles, La.
Feb. 5------	14	432	150	433	4	54	79	150	245	165	454	713	73	375	330	83	114	364	114	---	169	432	---	18	(487)	82	379	250	235	436	373	21	445	206	435
Feb. 6------	13	372	248	---	7	74	161	243	262	234	462	651	(164)	392	313	173	76	334	257	258	103	411	---	67	(357)	177	385	245	329	396	416	75	418	90	428
Feb. 7------	35	447	186	399	(17)	62	231	277	282	282	307	620	191	210	408	369	137	---	266	293	136	443	---	62	501	223	---	263	405	387	272	331	473	293	435
Feb. 8------	24	444	211	---	10	54	271	127	271	140	497	631	149	149	381	67	98	383	102	166	183	452	---	(38)	488	(237)	376	281	398	436	114	229	460	57	452
Feb. 9------	21	374	220	443	29	91	271	123	221	106	493	612	181	407	390	324	90	394	156	116	180	386	395	67	488	272	377	279	390	454	(389)	340	440	163	450
Feb. 10------	30	452	256	---	14	67	167	199	75	205	466	561	152	372	395	358	75	382	187	248	88	420	403	71	(386)	232	388	174	379	396	427	335	474	114	255
Feb. 11------	35	456	50	203	34	105	308	171	95	168	456	582	324	189	437	231	109	407	165	220	100	428	303	52	494	359	313	259	106	206	190	345	364	138	384
Averages------	25	425	189	370	(16)	72	213	184	207	186	448	624	(176)	299	379	229	100	378	178	217	137	424	---	(53)	(457)	(226)	370	250	320	387	(311)	240	439	151	405
Departures----	---	---	---	---	---	---	---	-33	---	+6	---	---	---	---	---	---	-135	---	+21	+15	---	---	---	-4	---	-37	---	---	---	---	---	---	---	-48	---
Feb. 12------	34	446	100	479	43	117	133	340	27	330	432	642	312	438	405	406	20	414	278	---	72	275	197	97	(491)	(51)	387	157	430	475	417	314	131	249	---
Feb. 13------	38	454	102	454	13	141	70	327	232	321	397	649	322	414	340	190	52	398	153	342	124	475	102	101	(194)	(86)	152	190	372	459	356	298	373	266	---
Feb. 14------	18	408	179	233	16	142	120	46	195	42	405	626	182	380	322	224	309	386	132	77	190	409	295	90	(405)	231	84	282	307	180	371	132	---	94	273
Feb. 15------	31	318	37	---	---	176	307	111	211	90	246	623	203	434	101	106	199	316	58	138	192	398	256	96	---	366	361	301	394	355	449	159	---	58	306
Feb. 16------	52	479	69	274	22	176	297	143	176	93	197	642	176	275	274	93	116	418	16	235	179	493	354	90	(536)	128	372	261	151	---	(438)	30	---	37	384
Feb. 17------	56	491	160	---	50	198	316	29	136	17	336	698	90	447	442	251	132	428	309	56	105	482	372	112	(533)	294	418	204	433	495	418	322	---	14	507
Feb. 18------	79	469	65	---	37	171	294	198	216	199	252	633	297	457	444	388	386	423	304	141	151	454	400	116	483	439	157	220	400	476	474	371	520	369	409
Averages------	44	438	102	360	31	160	220	170	170	156	324	645	226	406	333	237	174	397	179	173	153	427	282	100	(440)	(228)	276	231	355	407	(418)	232	---	155	376
Departures----	---	---	---	---	---	---	---	-62	---	-33	---	---	---	---	---	---	-114	---	-11	-46	---	---	---	+25	---	-79	---	---	---	---	---	---	---	-54	---
Feb. 19------	77	480	24	---	26	178	268	346	164	314	403	635	334	411	173	409	394	---	278	343	186	526	460	113	357	428	440	148	297	159	426	355	517	358	330
Feb. 20------	---	513	78	72	---	191	305	354	116	332	463	671	340	185	36	126	382	---	40	356	247	524	436	104	491	430	438	242	39	91	312	113	525	263	436
Feb. 21------	73	508	155	---	43	161	333	226	146	247	472	662	325	303	320	280	315	437	25	335	138	522	412	157	(469)	439	421	133	333	498	116	332	529	67	422
Feb. 22------	93	510	249	---	(62)	193	159	96	337	93	410	656	131	459	413	390	413	274	288	71	199	522	448	118	520	417	435	190	394	544	266	344	---	75	448
Feb. 23------	82	502	165	---	84	200	337	352	338	337	269	656	310	447	61	234	401	457	74	351	77	424	456	143	543	444	449	164	432	498	500	85	542	378	308
Feb. 24------	57	521	279	193	89	203	144	307	338	262	516	613	170	132	459	153	402	442	42	319	240	503	466	82	466	445	453	---	103	232	191	191	543	19	514
Feb. 25------	67	538	31	---	54	220	138	54	251	46	495	561	135	482	---	262	406	427	100	69	138	524	440	123	546	448	308	---	473	---	496	233	549	92	505
Averages------	73	510	140	---	(60)	192	241	248	241	233	432	636	249	346	244	265	387	408	121	263	175	506	445	120	(485)	436	421	176	296	337	330	236	534	179	423
Departures----	---	---	---	---	---	---	---	-15	---	+14	---	---	---	---	---	---	+71	---	-66	+13	---	---	---	+25	---	+137	---	---	---	---	---	---	---	-62	---
Feb. 26------	81	387	237	507	51	232	251	268	318	271	335	579	316	475	377	441	381	411	314	294	242	481	444	158	546	423	309	---	457	515	461	398	497	21	306
Feb. 27------	98	531	231	283	64	228	342	98	370	98	502	641	(285)	395	41	272	440	387	93	140	213	490	487	167	362	467	462	---	481	284	509	40	565	365	395
Feb. 28------	117	559	194	94	107	175	169	291	364	265	527	653	(301)	220	342	49	432	483	101	307	152	551	480	134	597	475	330	---	273	82	450	75	553	289	---
Mar. 1------	94	543	374	560	53	111	144	102	374	68	424	685	(341)	525	450	239	452	369	71	291	248	(542)	504	60	524	425	495	---	372	560	354	426	464	82	560
Mar. 2------	---	544	347	511	62	166	365	399	409	377	302	633	91	513	51	397	439	356	300	396	355	473	517	---	548	(471)	471	---	481	495	(567)	291	580	329	245
Mar. 3------	66	562	377	370	116	300	428	258	426	243	255	607	(378)	308	554	229	423	514	209	288	301	258	490	72	618	443	508	---	320	---	240	366	384	78	558
Mar. 4------	119	345	372	573	146	115	416	411	384	370	48	656	(159)	543	576	301	287	458	274	395	292	300	518	180	154	463	516	---	538	542	573	466	580	274	334
Averages------	94	497	305	414	86	189	302	261	378	242	342	636	(267)	425	342	275	408	425	194	301	258	(442)	491	129	478	(453)	442	---	418	413	(451)	295	518	206	400
Departures----	---	---	---	---	---	---	---	-20	---	+8	---	---	---	---	---	---	+85	---	-14	+38	---	---	---	-2	---	+95	---	---	---	---	---	---	---	-19	---

Accumulated Departures January 1 to March 4, 1954

Aklavik, Mackenzie	Albuquerque, N.Mex.	Astoria, Oreg.	Atlanta, Ga.	Barrow, Alaska	Bethel, Alaska	Bismark, N. Dak.	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Tex.	Canton Island, Pacific Area	Caribou, Me.	Charleston, S. C.	Columbia, Mo.	Columbus, Ohio	Davis, Calif.	Dodge City, Kans.	E. Lansing, Mich.	E. Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Ely, Nev.	Fairbanks, Alaska	Fort Worth, Tex.	Fresno, Calif.	Grand Junction, Colo.	Great Falls, Mont.	Greensboro, N. C.	Griffin, Ga.	Hatteras, N. C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.	Lake Charles, La.
---	---	---	---	---	---	---	-2282	---	---	---	---	---	---	---	---	-1652	---	-532	+140	---	---	---	+315	---	+2576	---	---	---	---	---	---	---	-1771	---

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

SOLAR RADIATION DATA

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.-Continued

	Lander, Wyo.	Las Vegas, Nev.	Lincoln, Nebr.	Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBCO)	Madison, Wisc.	Medford, Ore.	Miami, Fla.	Midland, Tex.	Nashville, Tenn.	Newport, R. I.	New York, N. Y.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Ottawa, Ontario	Phoenix, Ariz.
1954																	
Feb. 5------	103	413	236	387	415	369	76	269	467	443	350	180	240	175	382	161	441
Feb. 6------	367	379	281	307	429	381	234	299	467	418	126	210	142	154	215	(156)	444
Feb. 7------	318	431	307	183	442	404	288	323	302	452	252	321	318	323	391	254	453
Feb. 8------	345	(431)	307	402	399	387	297	317	266	457	359	155	66	298	387	(181)	456
Feb. 9------	342	275	331	398	426	389	306	310	499	409	374	135	242	358	387	(251)	363
Feh. 10------	386	426	339	382	377	344	310	205	495	374	297	234	195	301	371	212	443
Feb. 11------	279	432	336	398	410	377	295	114	326	468	329	186	141	169	408	(204)	439
Averages------	306	(398)	305	351	414	379	258	262	403	432	298	203	192	254	363	(203)	434
Departures----	---	---	+57	---	---	---	+53	---	---	---	+90	-14	---	---	---	---	---
Feb. 12------	275	368	339	418	148	200	229	107	413	428	408	388	375	396	402	362	(456)
Feb. 13------	---	211	310	272	20	32	182	126	413	460	398	378	289	377	306	(354)	448
Feb. 14------	367	402	233	221	416	(364)	188	262	486	449	214	64	79	108	387	108	95
Feb. 15------	370	465	101	191	452	(406)	136	116	371	459	253	225	244	209	296	56	496
Feb. 16------	249	461	369	251	480	425	180	243	371	459	76	267	243	52	441	50	451
Feb. 17------	365	469	267	465	361	304	187	96	256	432	147	38	34	83	359	109	499
Feh. 18------	206	493	349	412	440	433	325	288	451	499	404	210	387	362	406	371	501
Averages------	305	410	281	318	331	(309)	204	177	394	455	272	224	236	227	371	(201)	(421)
Departures----	---	---	+22	---	---	---	-22	---	---	---	+37	+41	+37	---	---	---	---
Feb. 19------	383	487	18	87	---	440	290	229	444	231	335	378	336	369	342	387	520
Feb. 20------	326	492	91	187	---	459	67	258	448	467	254	381	361	57	395	(392)	519
Feb. 21------	343	493	316	323	450	441	171	156	420	504	387	276	48	338	394	82	519
Feb. 22------	347	493	---	426	499	452	252	357	533	478	434	101	361	421	402	(263)	524
Feb. 23------	372	499	384	406	516	470	63	373	499	441	290	386	408	378	452	409	527
Feb. 24------	359	501	380	463	521	482	193	363	333	513	412	323	211	205	403	86	523
Feb. 25------	199	506	102	433	512	465	82	229	548	498	407	168	347	400	436	223	519
Averages------	333	496	215	332	499	458	160	281	461	452	360	288	296	310	403	(263)	522
Departures----	---	---	-59	---	---	---	-83	---	---	---	+111	---	+62	---	---	---	---
Feb. 26------	206	471	291	475	190	311	145	334	384	504	301	289	78	316	441	138	517
Feb. 27------	433	535	292	342	490	(435)	136	422	553	326	329	190	405	374	130	382	538
Feb. 28------	415	541	390	382	501	(509)	227	424	88	537	---	349	238	7	---	347	554
Mar. 1------	345	547	169	494	362	315	394	(428)	578	568	466	250	98	385	463	165	504
Mar. 2------	586	565	349	100	431	373	294	442	335	432	454	436	430	460	379	(195)	445
Mar. 3------	369	469	459	548	296	239	422	428	438	421	183	278	73	204	516	109	547
Mar. 4------	496	567	456	440	472	398	436	416	339	292	493	402	334	484	313	(324)	536
Averages------	407	528	344	397	392	(368)	293	(413)	388	440	371	314	237	319	374	(237)	520
Departures----	---	---	+43	---	---	---	+25	---	---	---	+93	---	-17	---	---	---	---
Accumulated Departures January 1 to March 4, 1954	---	---	+329	---	---	---	-126	---	---	---	+3647	---	---	---	---	---	---

	Prosser 4 NE, Wash.	Rapid City, S. Dak.	Riverside, Calif.	San Antonio, Tex.	Santa Maria, Calif.	S. Ste. Marie, Mich.	Sayville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle, Wash. (U. of W.)	* Seattle, Wash. (WBAS)	State College, Pa.	Stillwater, Okla.	Swan Island, W. I.	Tampa, Fla.	Upton, N. Y.	Wake Island, Pacific Area	Winnipeg, Manitoba
1954																		
Feb. 5------	98	170	416	526	429	138	271	129	285	108	99	120	---	390	456	268	259	---
Feb. 6------	88	286	434	524	432	---	174	147	277	215	222	212	---	533	461	170	247	---
Feb. 7------	63	289	438	559	436	---	331	268	327	193	231	299	---	---	440	329	267	---
Feb. 8------	84	315	345	552	449	245	118	89	230	102	114	81	---	281	380	145	271	---
Feb. 9------	76	315	425	502	450	192	185	224	205	62	46	211	---	490	470	196	238	(224)
Feh. 10------	129	175	416	462	315	270	173	132	339	239	246	249	---	471	439	183	273	239
Feb. 11------	84	188	422	548	295	---	(160)	318	105	90	95	181	---	538	299	144	158	269
Averages------	89	248	414	525	401	211	(202)	187	253	144	150	194	---	450	421	205	245	---
Departures----	---	---	+109	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Feb. 12------	229	219	367	461	105	305	403	284	373	66	71	355	---	504	299	372	168	196
Feb. 13------	305	186	51	241	114	127	---	95	313	80	79	156	---	550	455	345	257	(150)
Feb. 14------	318	273	319	351	435	286	88	46	122	169	186	45	---	505	418	94	178	(221)
Feb. 15------	86	289	455	165	442	113	295	69	312	52	70	98	---	475	410	289	218	301
Feb. 16------	164	323	474	555	108	198	289	22	273	30	37	208	---	522	470	280	220	---
Feb. 17------	80	359	337	407	183	---	46	268	122	103	101	43	415	551	494	41	261	319
Feh. 18------	275	285	436	193	487	340	400	305	393	83	67	370	421	554	488	383	221	(229)
Averages------	208	276	348	339	268	228	254	155	273	83	87	182	---	523	433	258	218	(237)
Departures----	---	---	+13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Feb. 19------	156	359	505	491	486	328	416	304	382	46	54	372	292	572	455	399	288	---
Feb. 20------	142	332	500	518	489	124	433	61	308	96	115	43	342	544	454	413	273	---
Feb. 21------	310	319	417	542	490	47	78	186	32	192	138	104	443	549	378	111	291	---
Feb. 22------	90	299	500	607	492	319	328	340	353	78	108	236	397	601	549	332	262	99
Feb. 23------	350	359	515	430	509	96	433	228	405	147	153	352	465	590	469	411	271	---
Feb. 24------	351	275	511	542	511	177	309	224	228	142	169	28	438	545	161	306	246	---
Feb. 25------	268	269	522	599	513	289	329	59	384	91	73	188	475	565	561	---	243	126
Averages------	238	316	496	533	498	197	333	200	299	113	116	199	407	566	432	329	268	---
Departures----	---	---	+160	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Feb. 26------	332	79	466	558	393	328	188	284	174	139	239	35	428	496	503	199	258	323
Feb. 27------	329	391	507	513	484	76	928	283	392	181	184	372	99	548	307	411	201	245
Feb. 28------	389	307	521	627	483	145	400	213	216	183	168	52	511	581	199	382	131	---
Mar. 1------	412	424	373	599	521	93	214	332	59	---	367	19	484	415	603	247	228	360
Mar. 2------	378	415	465	544	334	211	436	102	412	---	296	298	285	601	546	432	278	346
Mar. 3------	415	476	286	386	376	373	130	286	36	---	378	92	540	599	228	161	284	357
Mar. 4------	420	387	475	285	498	303	319	232	356	---	364	279	345	599	595	303	284	408
Averages------	382	354	442	502	441	218	374	247	235	---	285	179	384	548	426	305	238	336
Departures----	---	---	+89	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Accumulated Departures January 1 to March 4, 1954	---	---	+2814	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

* January data published as Seattle, Wash., is Seattle-Tacoma Airport.

ILLUMINATION DATA

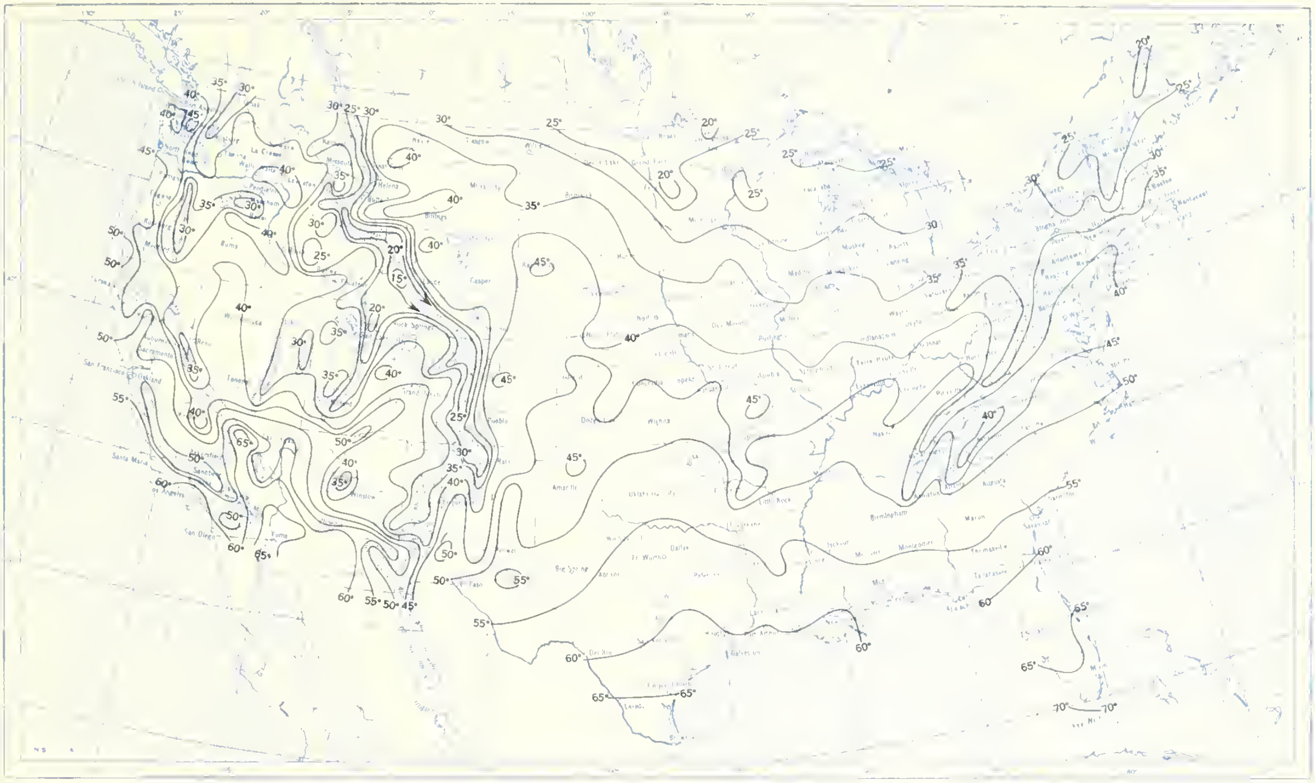
Table 34.-Daily illumination on a horizontal surface, tabulated in hundreds of foot-candle hours. FEBRUARY 1954

Station	Day of month																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average
Baltimore, Md.----------------	252	192	102	150	342	315	357	204	296	368	164	411	300	280	390	354	312	448	434	82	72	435	428	219	434	246	447	255				296
Washington, D. C. (WBCO)------	248	224	---	190	308	241	312	264	340	362	136	395	228	307	363	316	279	435	383	84	78	419	444	195	426	261	431	226				292

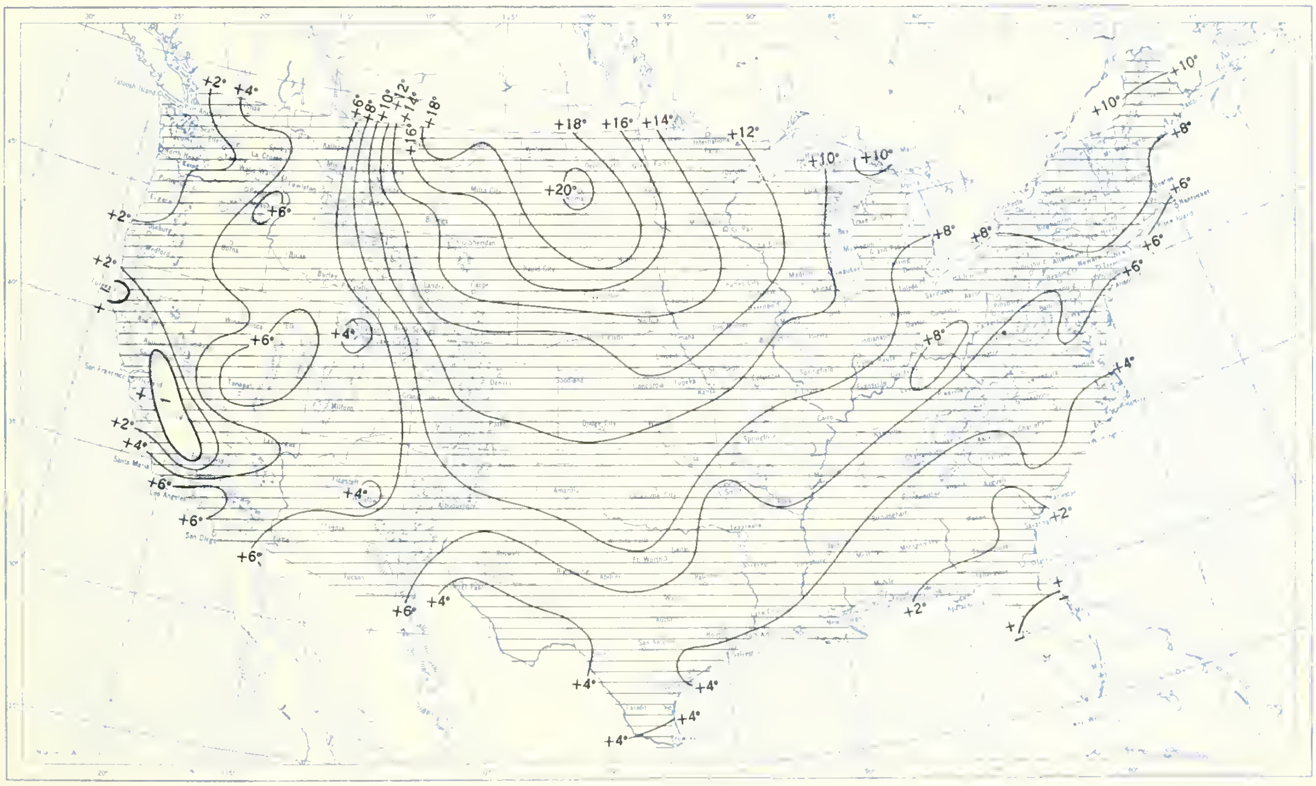
The foot-candle hour is the average illumination for one hour, in foot-candles. Foot-candle hours for a day are obtained by summing the foot-candle hours for the individual hours of that day. The illumination values are compiled from continuous records of the illumination output of a Foster Illuminometer. For a description of this instrument see "A Recording Daylight Illuminometer", by Norman B. Foster, in Illuminating Engineering, Vol. XLVI No. 2, pages 59 to 62.

NWRC, Asheville, N. C. --- 5/17/54 --- 2200

Chart I. A. Average Temperature (°F.) at Surface, February 1954.



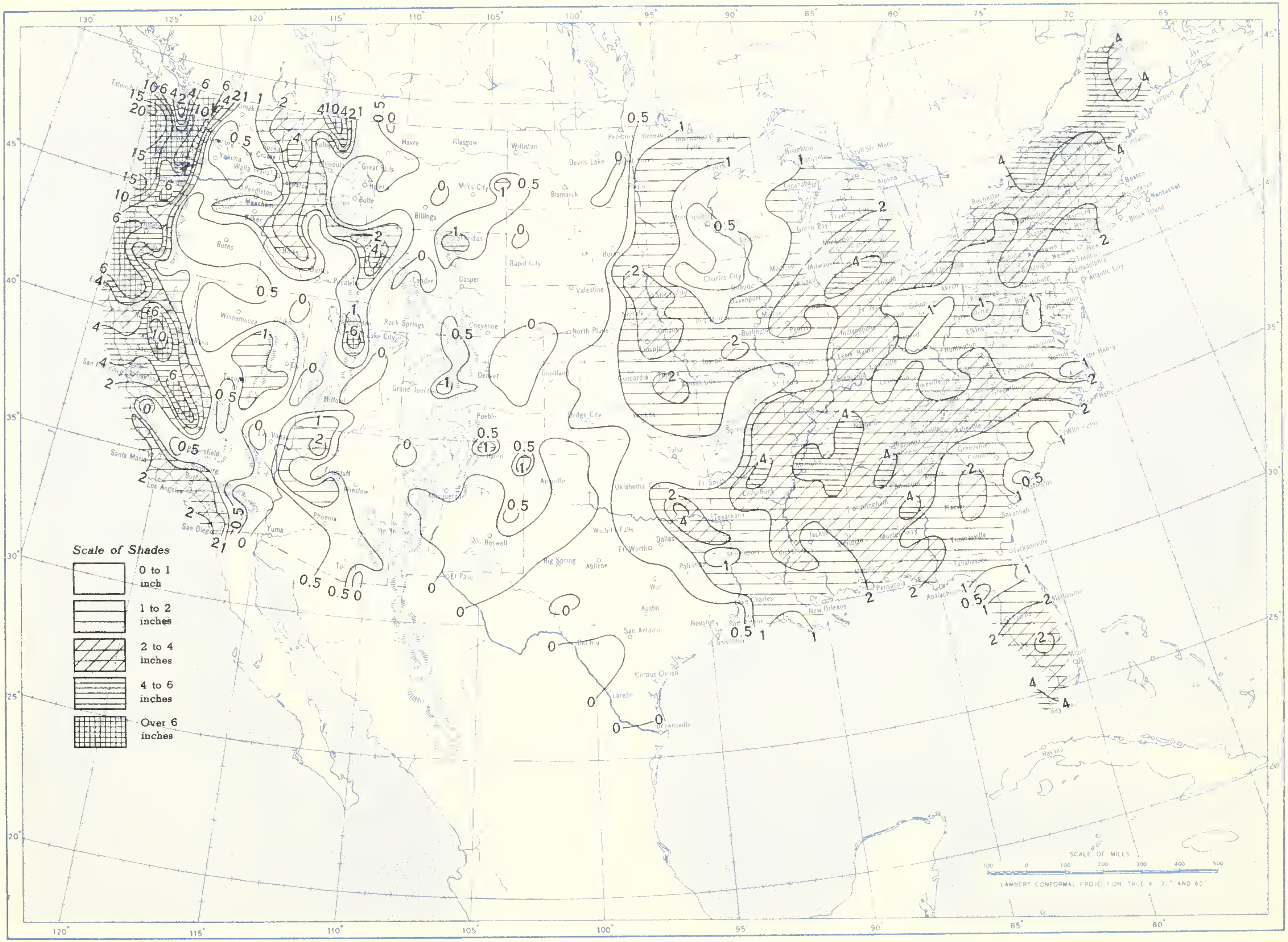
B. Departure of Average Temperature from Normal (°F.), February 1954.



A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.

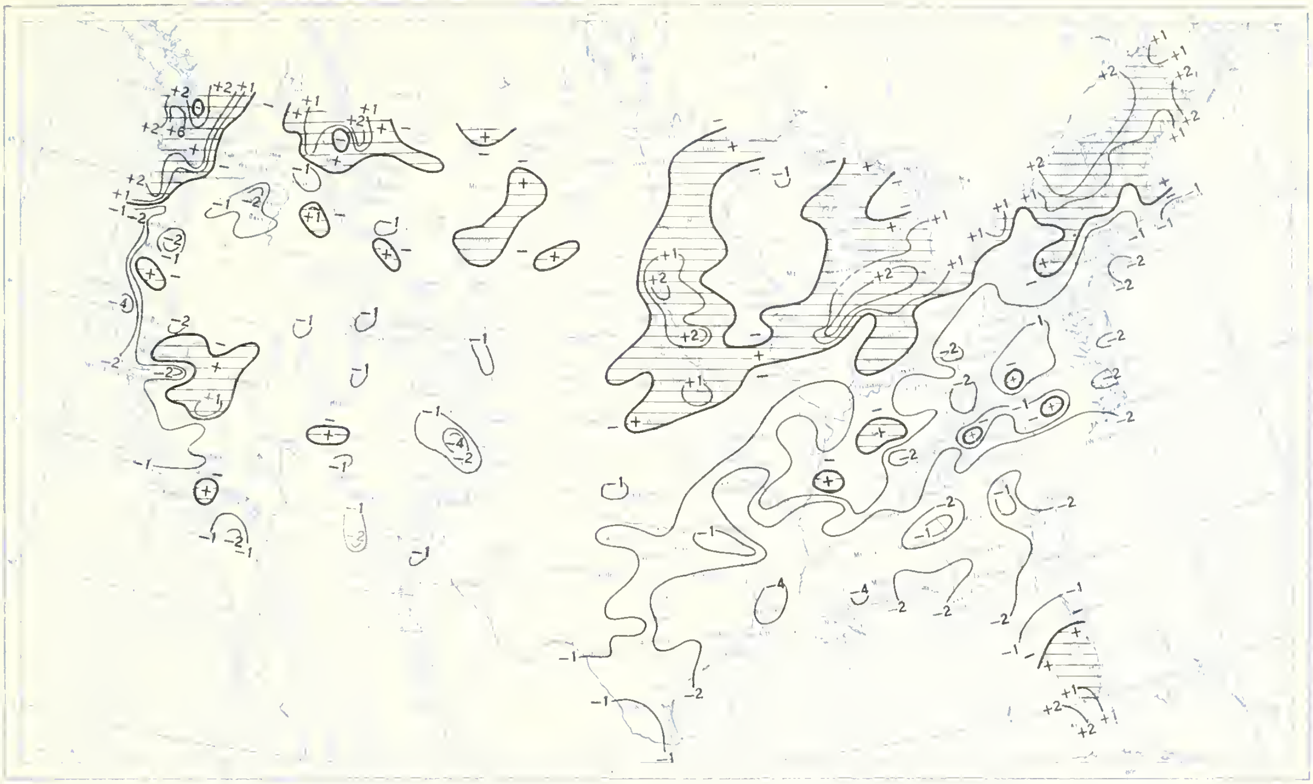
B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), February 1954.

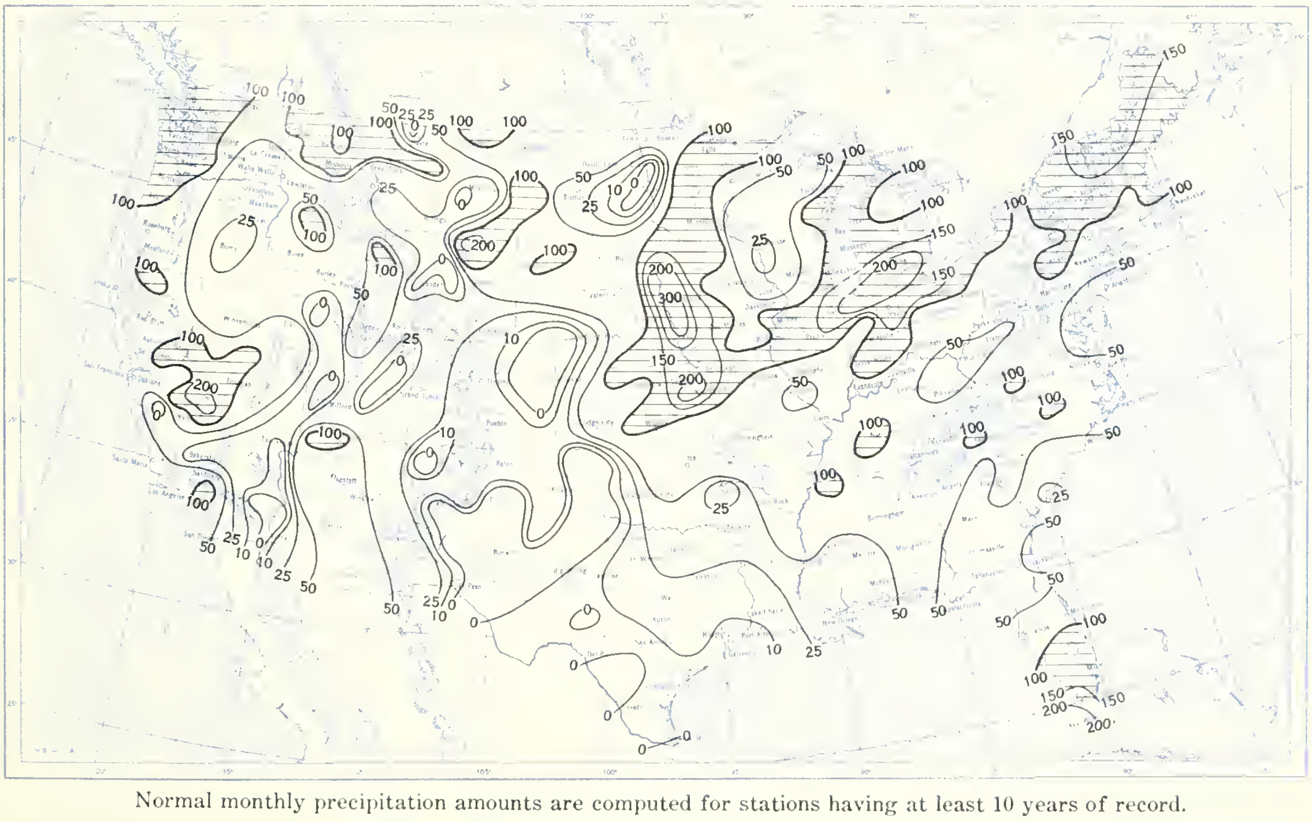


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), February 1954.

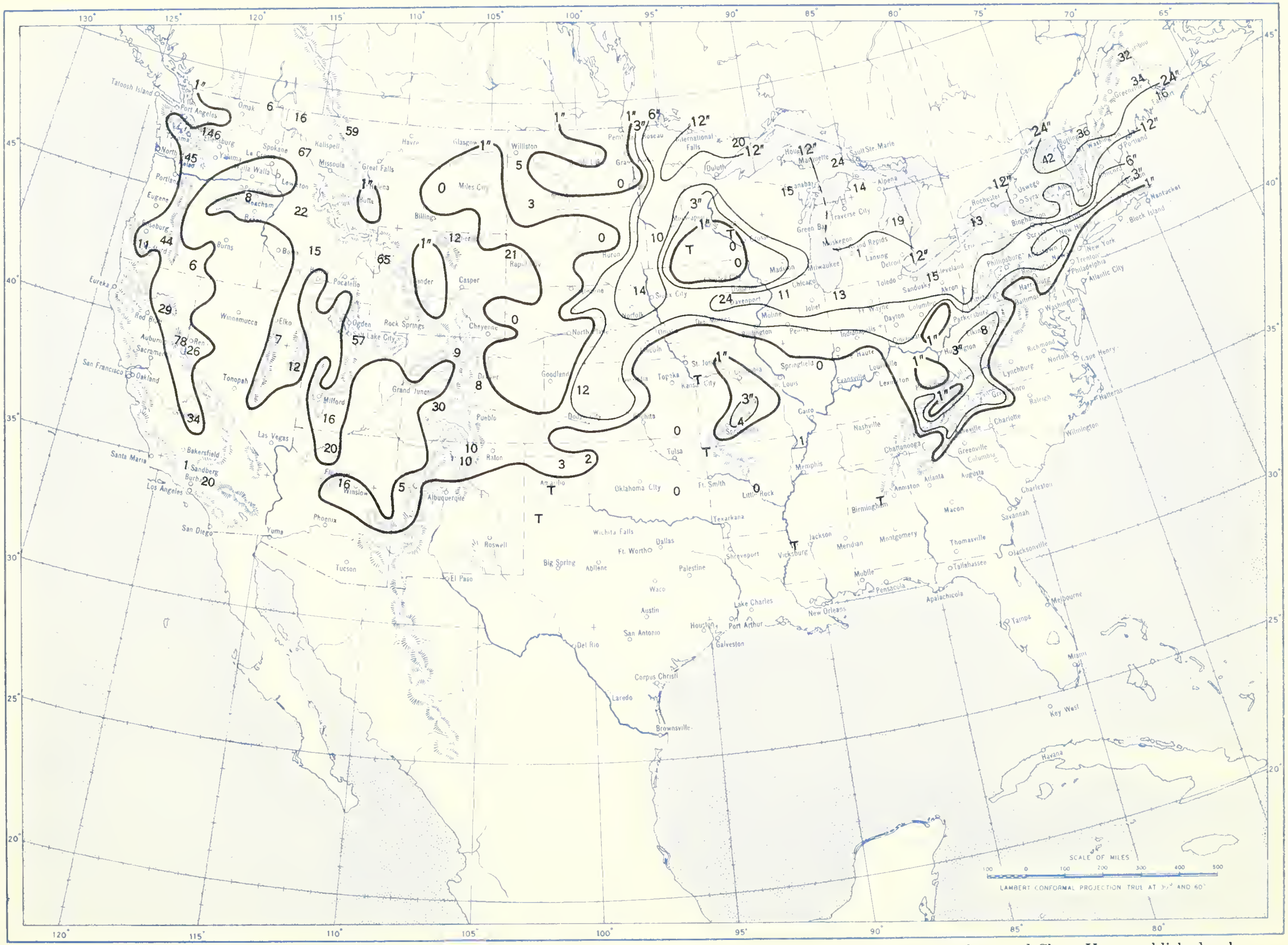


B. Percentage of Normal Precipitation, February 1954.



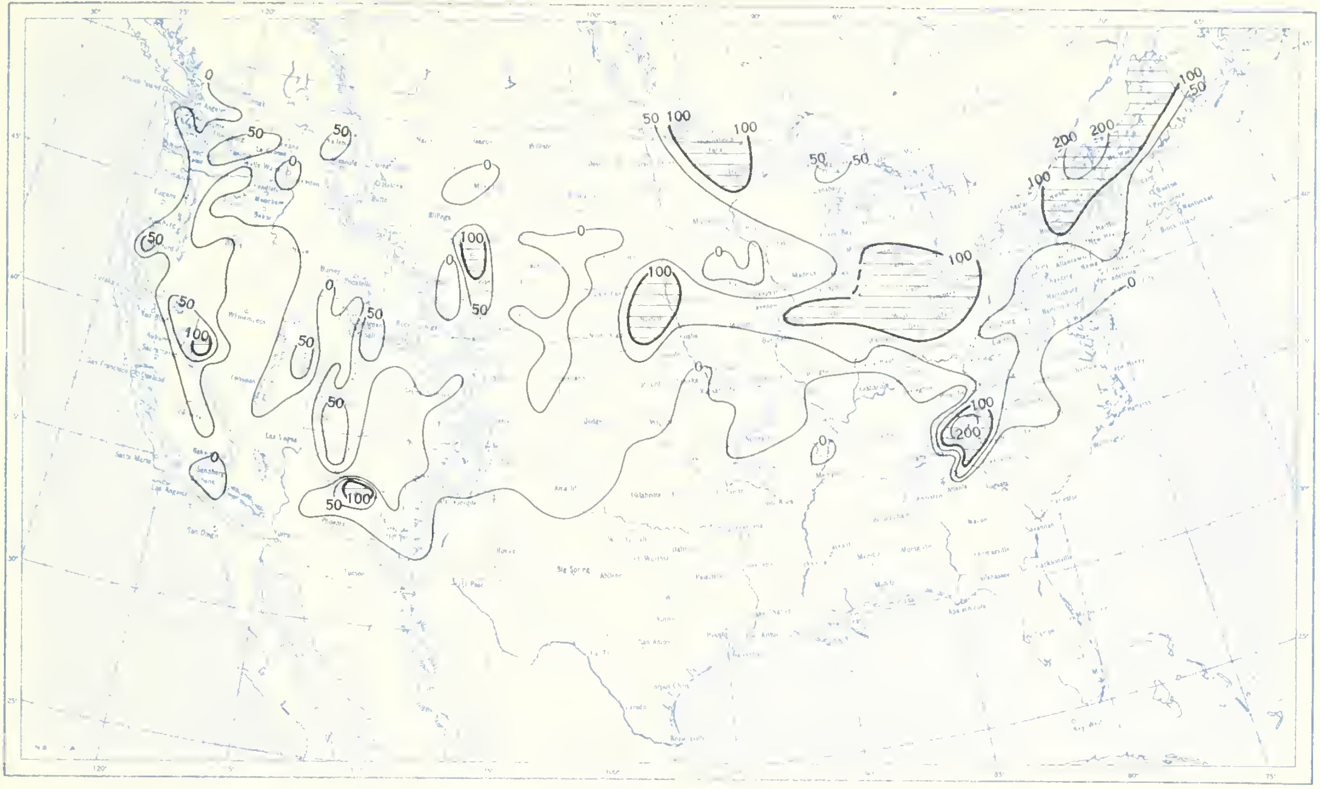
Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart IV. Total Snowfall (Inches), February 1954.

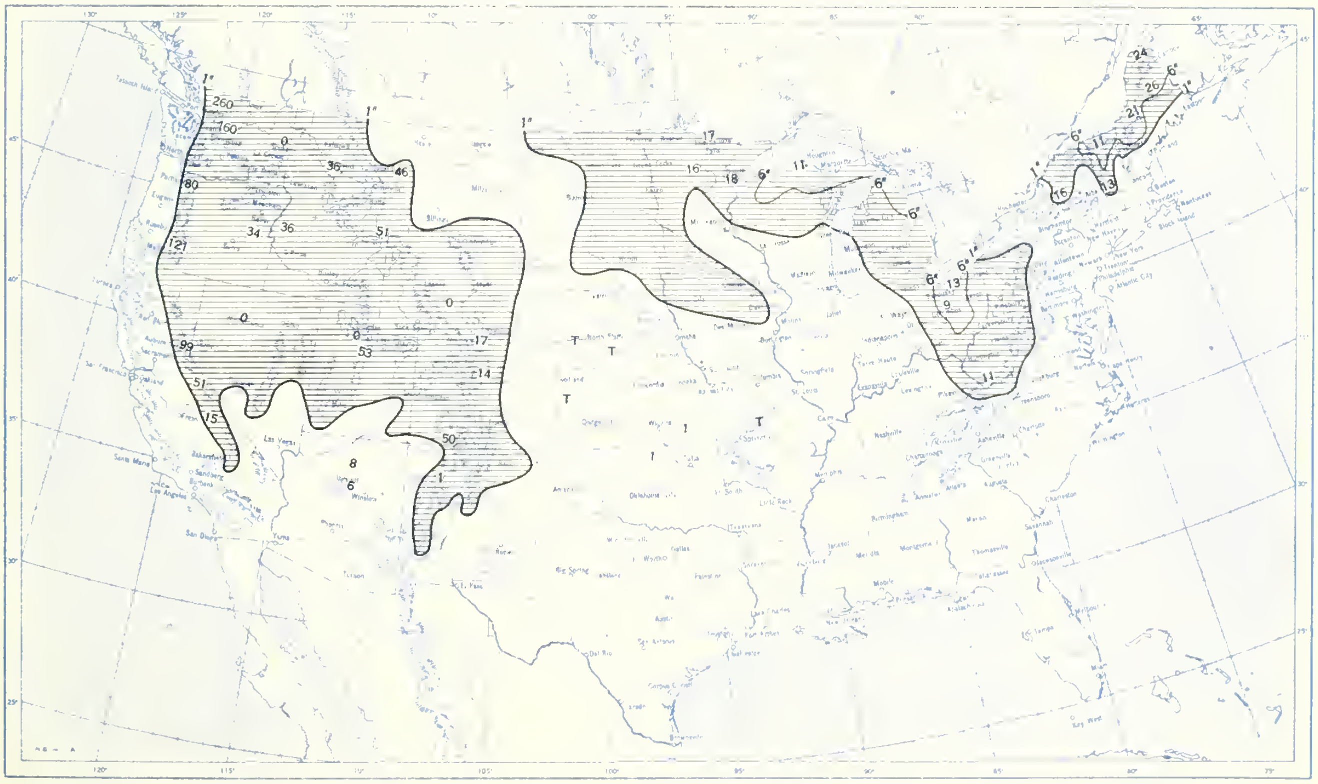


This is the total of unmelted snowfall recorded during the month at Weather Bureau and cooperative stations. This chart and Chart V are published only for the months of November through April although of course there is some snow at higher elevations, particularly in the far West, earlier and later in the year.

Chart V. A. Percentage of Normal Snowfall, February 1954.

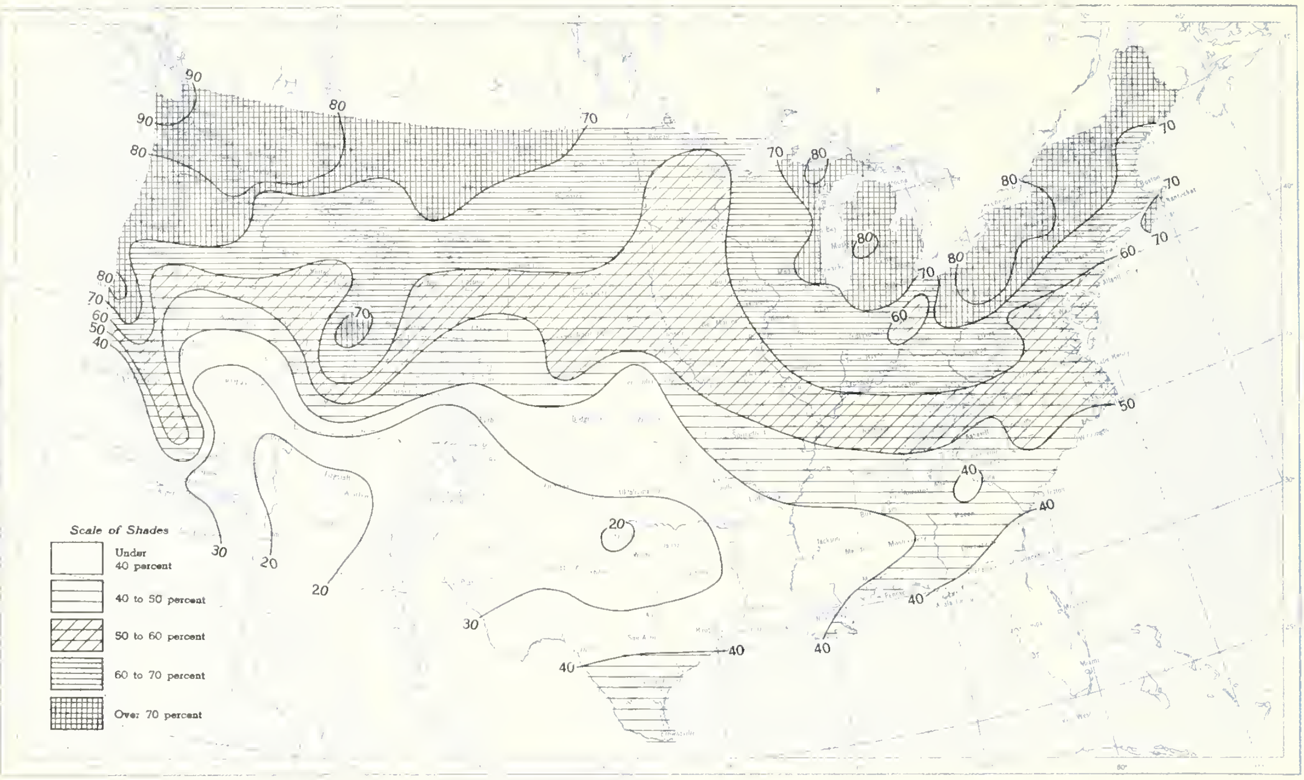


B. Depth of Snow on Ground (Inches), 7:30 a. m. E. S. T., February 23, 1954.

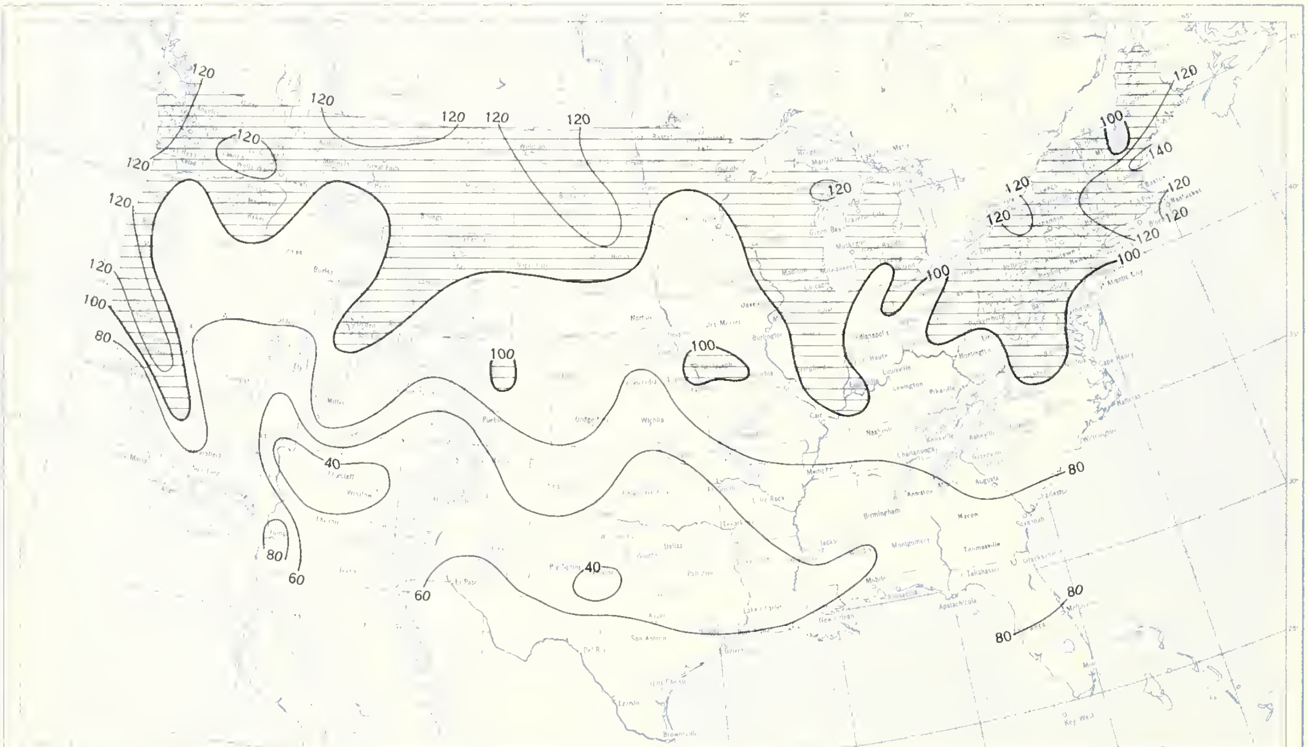


A. Amount of normal monthly snowfall is computed for Weather Bureau stations having at least 10 years of record. B. Shows depth currently on ground at 7:30 a. m. E.S.T., of the Tuesday nearest the end of the month. It is based on reports from Weather Bureau and cooperative stations. Dashed line shows greatest southern extent of snowcover during month.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, February 1954.

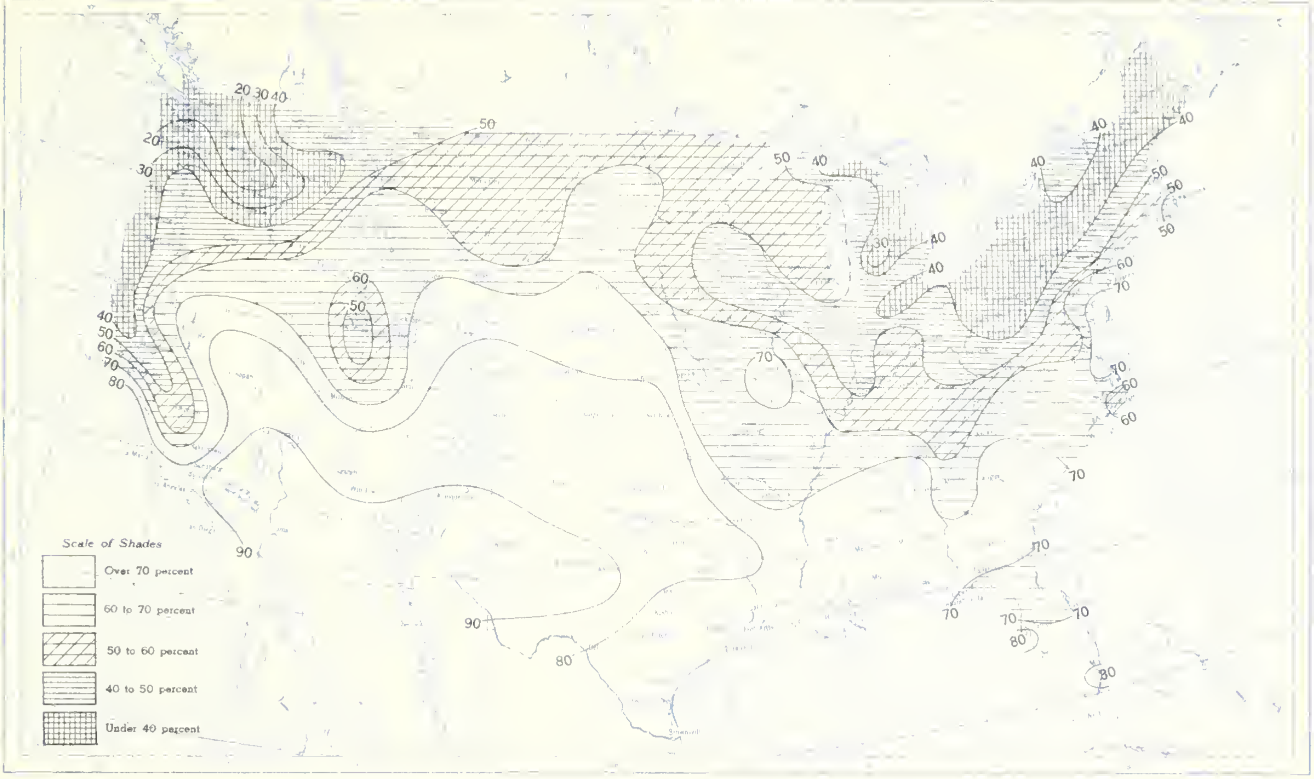


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, February 1954.

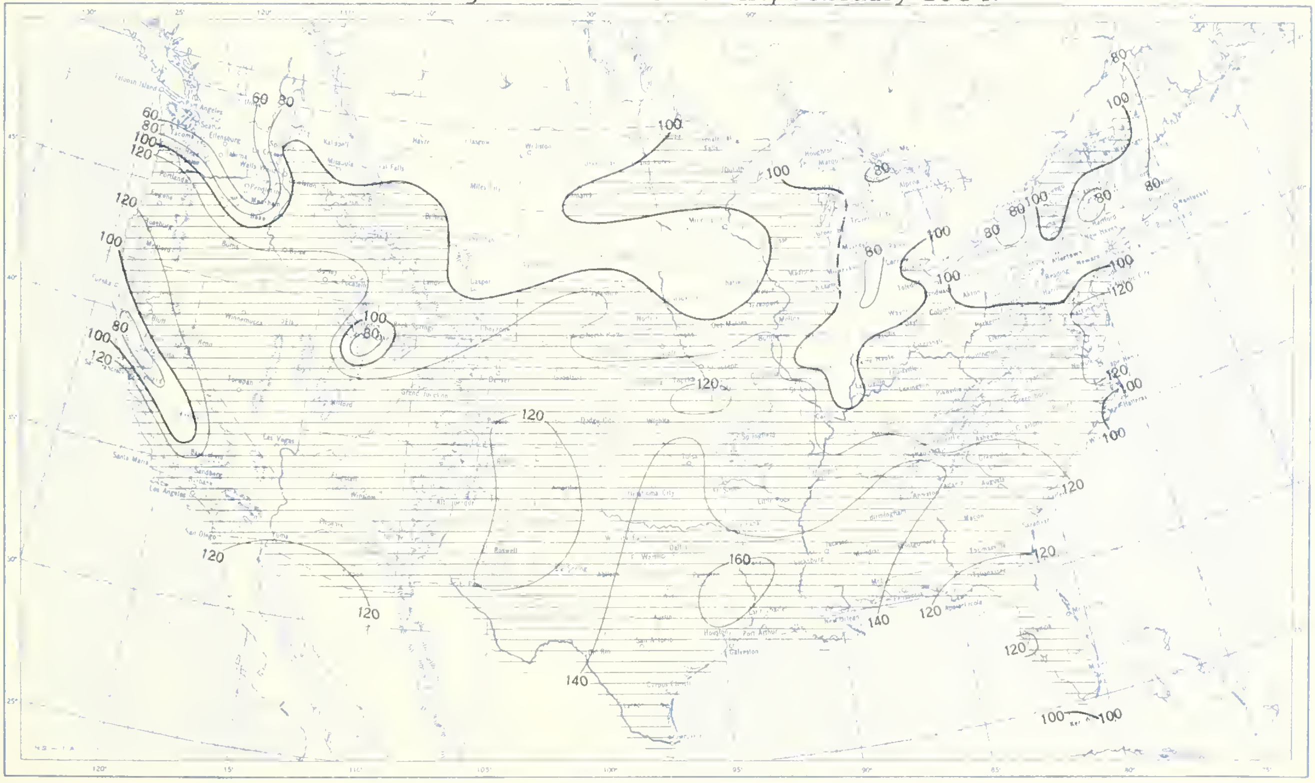


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, February 1954.



B. Percentage of Normal Sunshine, February 1954.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, February 1954. Inset: Percentage of Normal Average Daily Solar Radiation, February 1954.

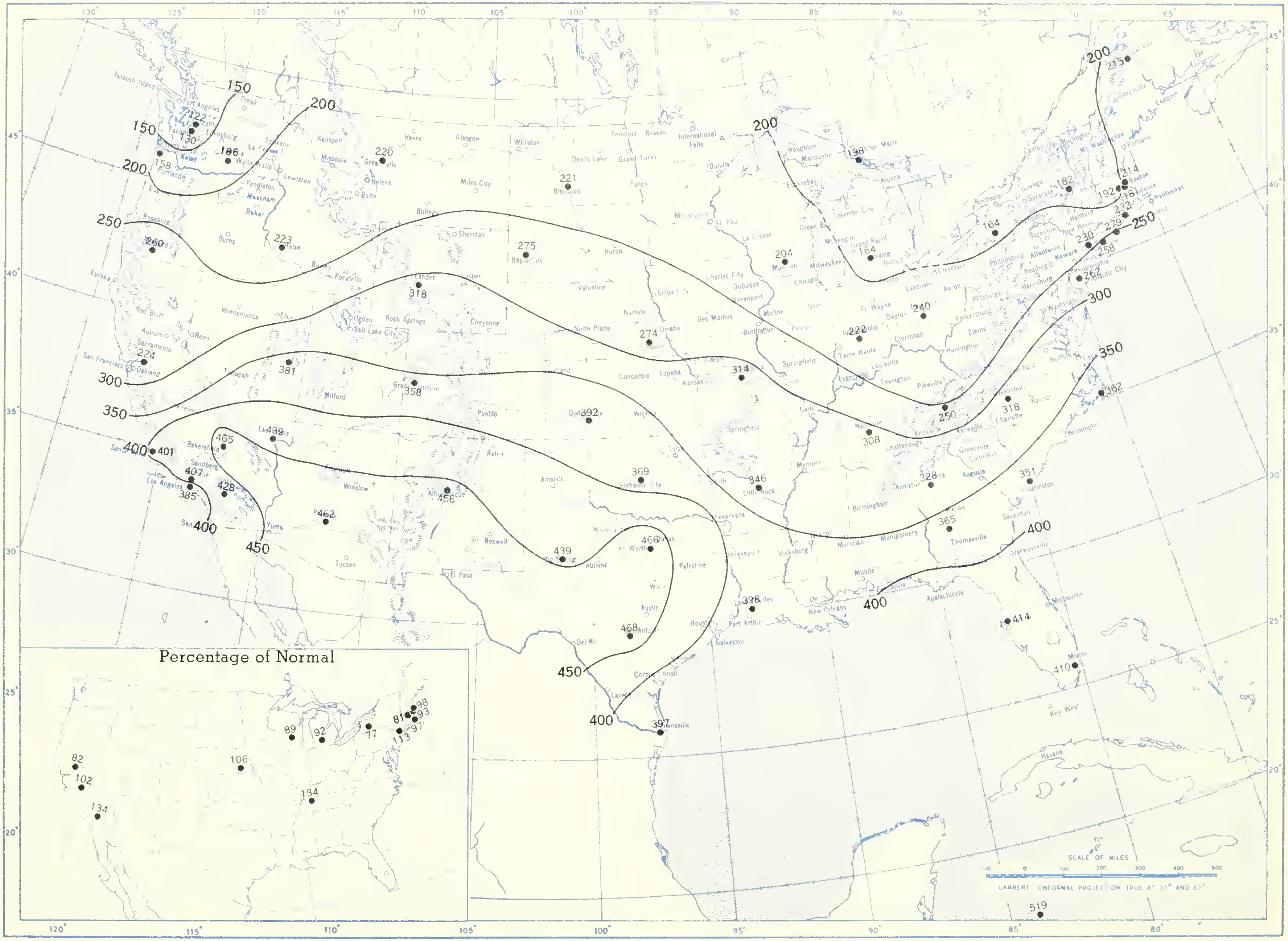
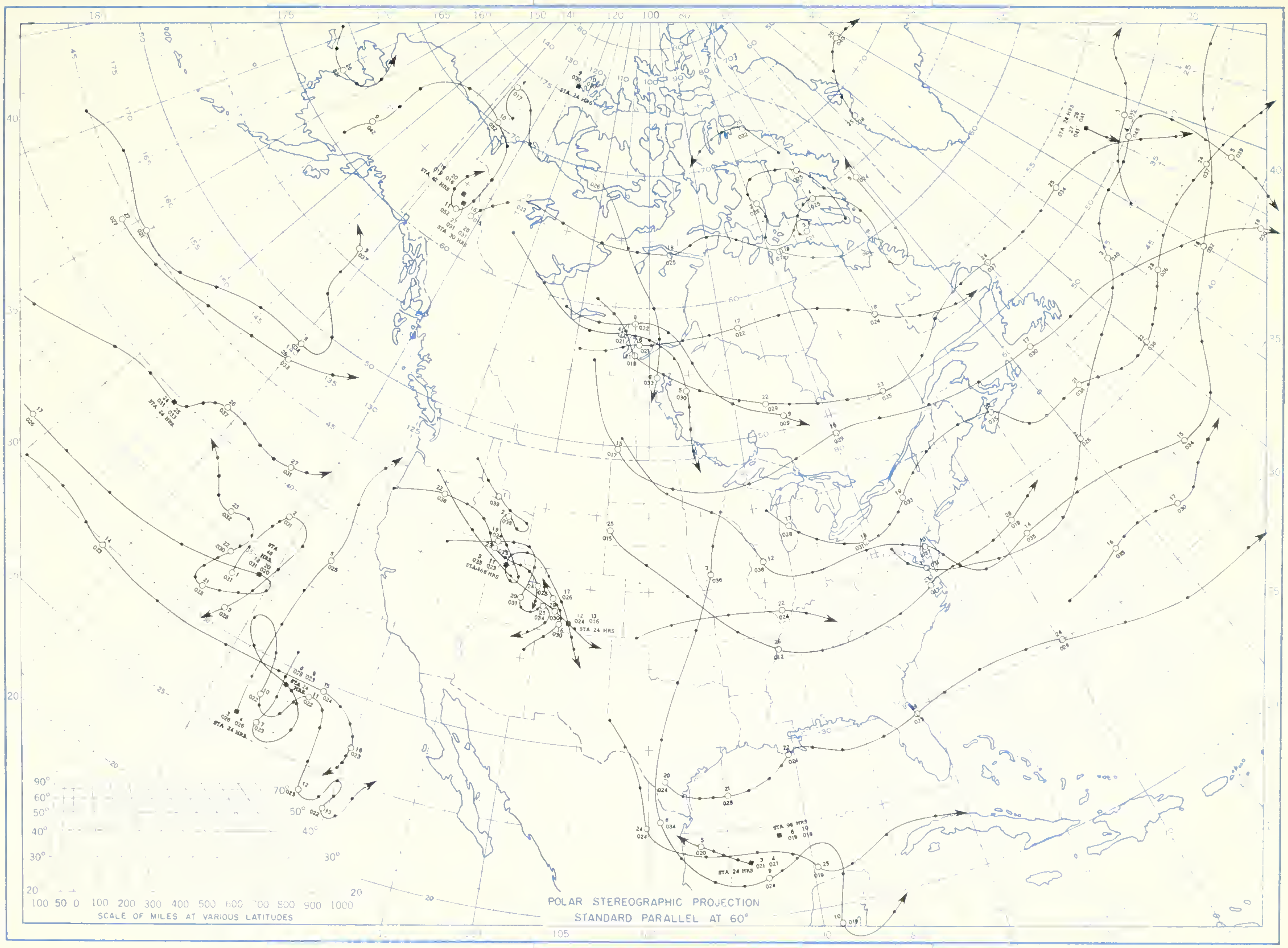


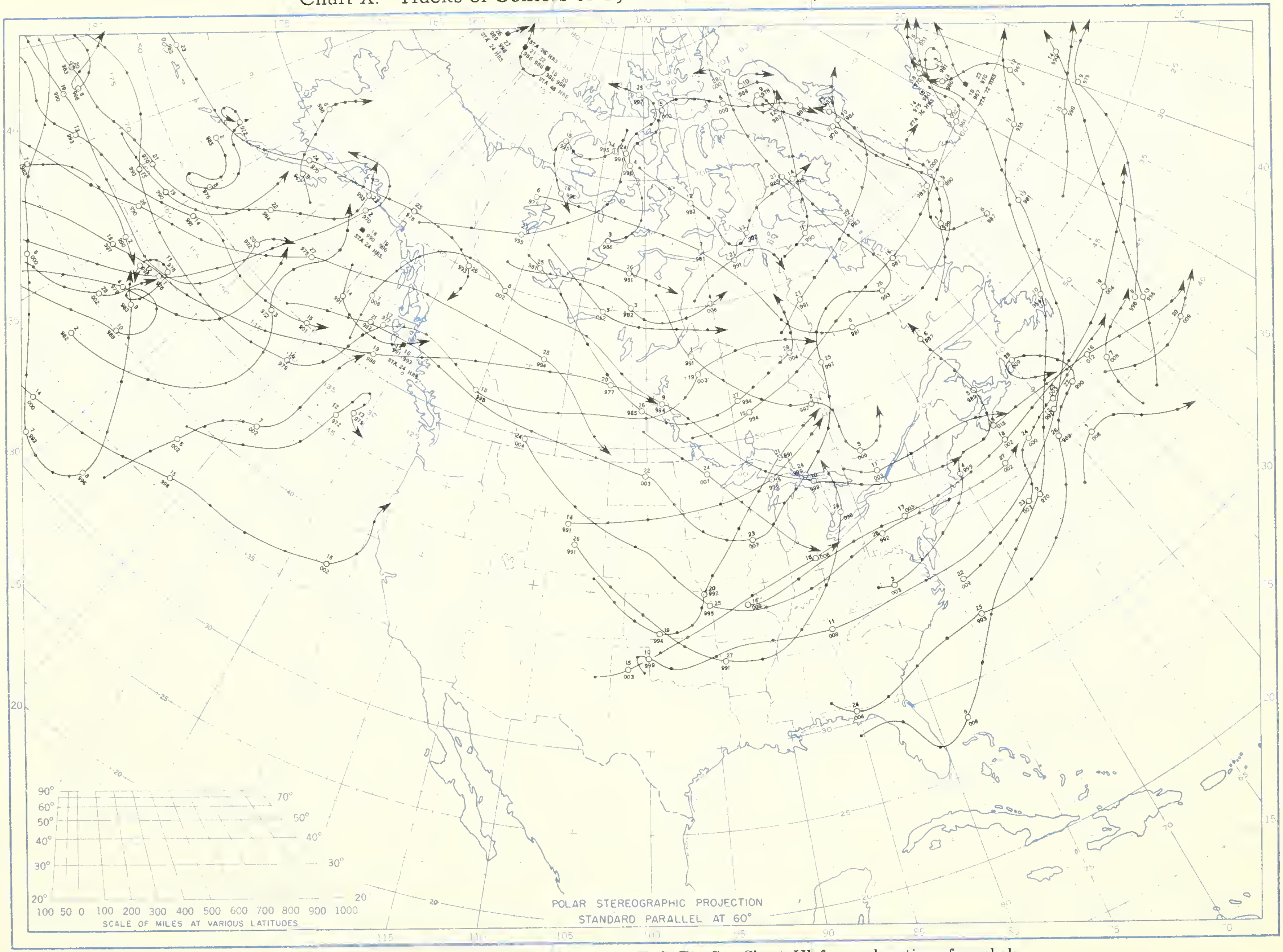
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm. $^{-2}$). Basic data for isolines are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals

Chart IX. Tracks of Centers of Anticyclones at Sea Level, February 1954.



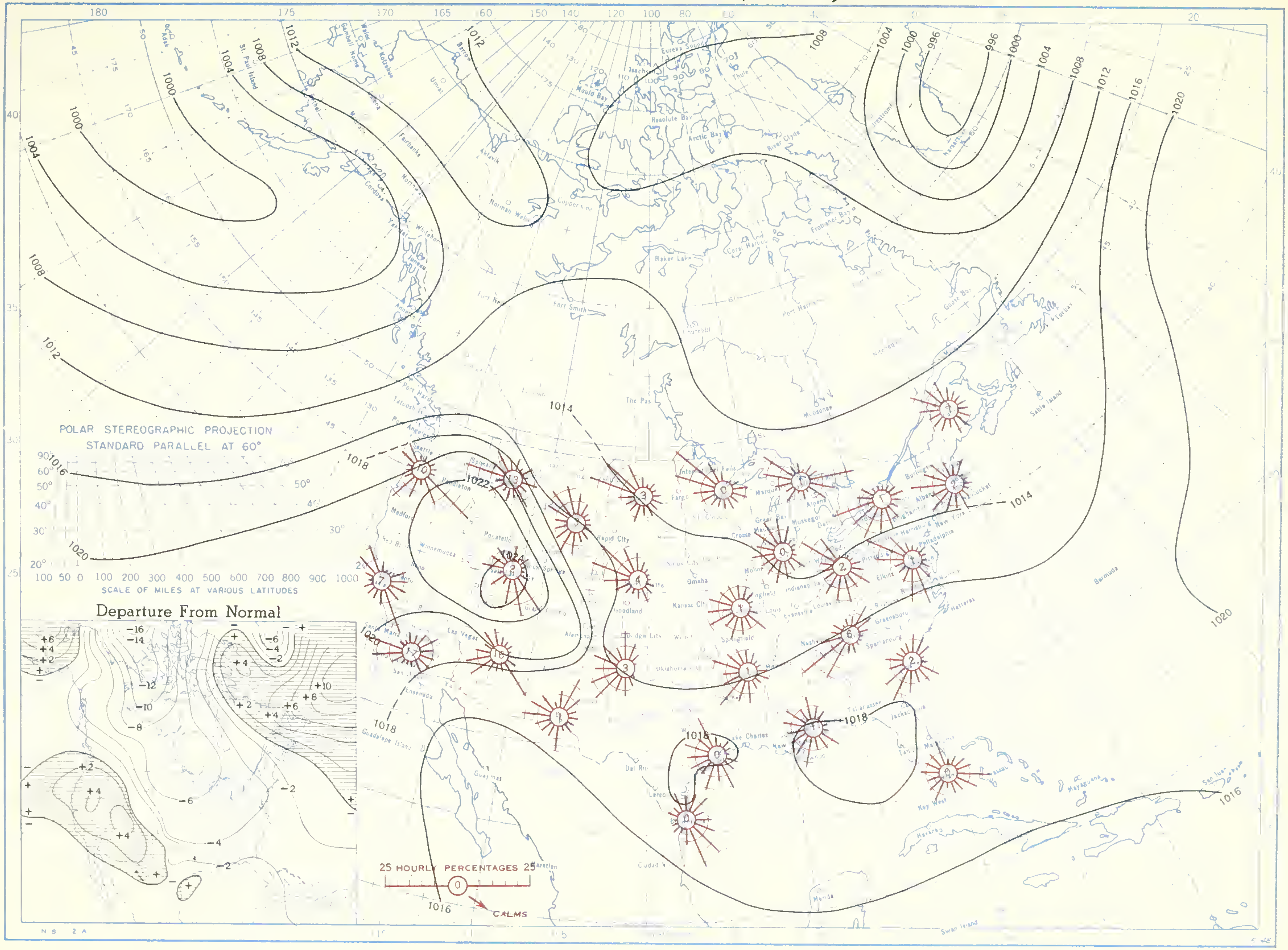
Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

Chart X. Tracks of Centers of Cyclones at Sea Level, February 1954.



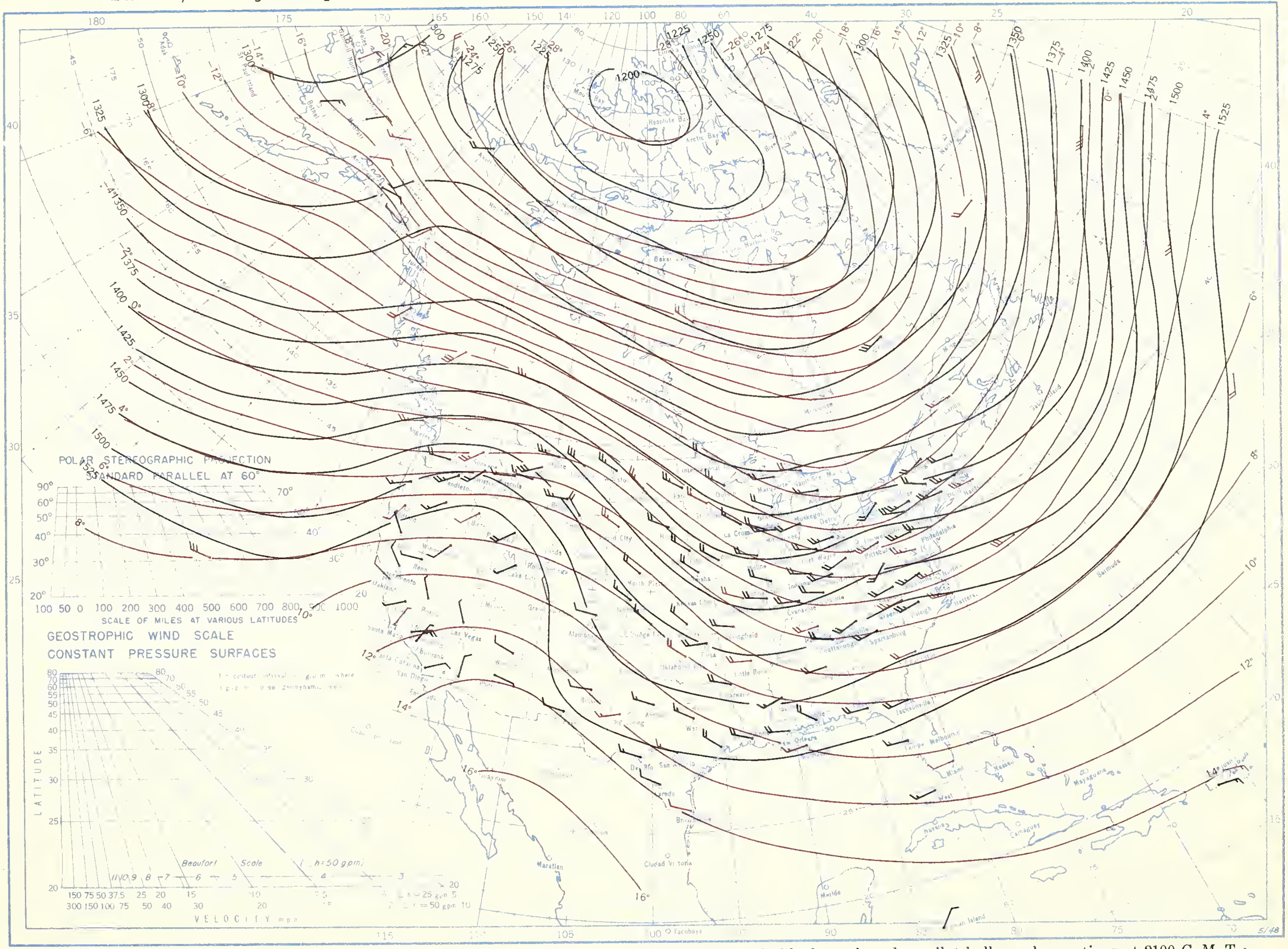
Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, February 1954. Inset: Departure of Average Pressure (mb.) from Normal, February 1954.



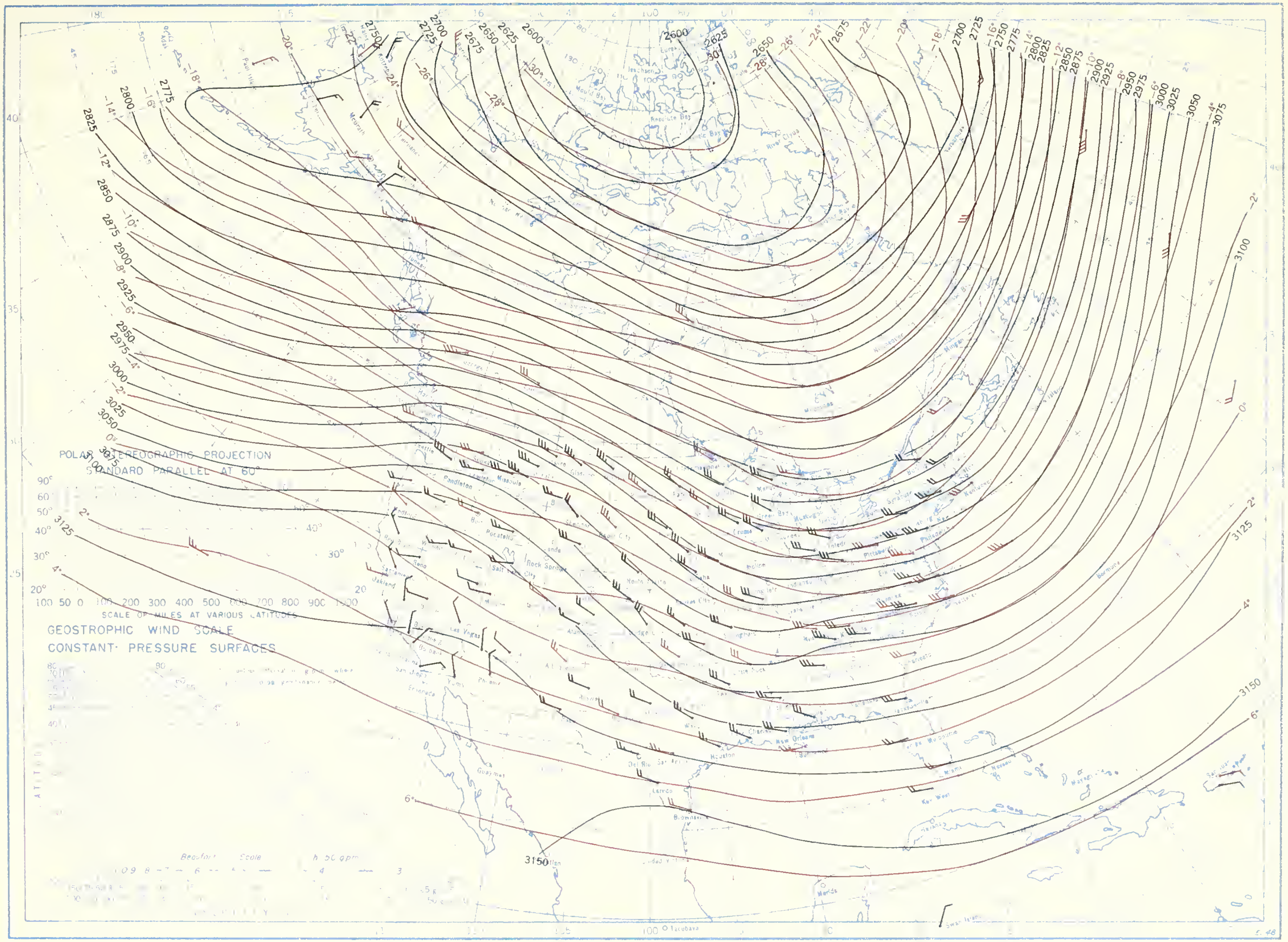
Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), February 1954.



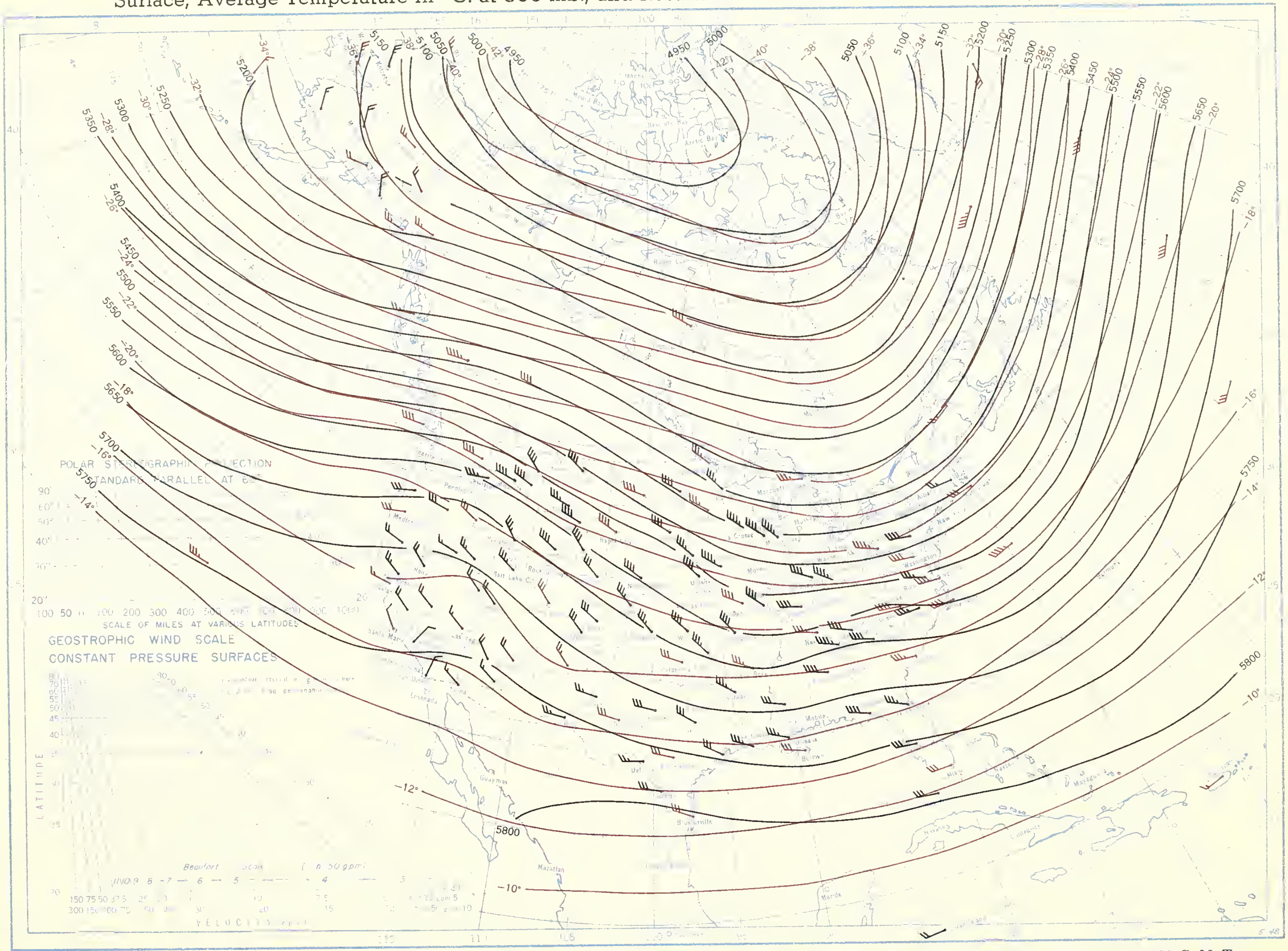
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m.. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), February 1954.



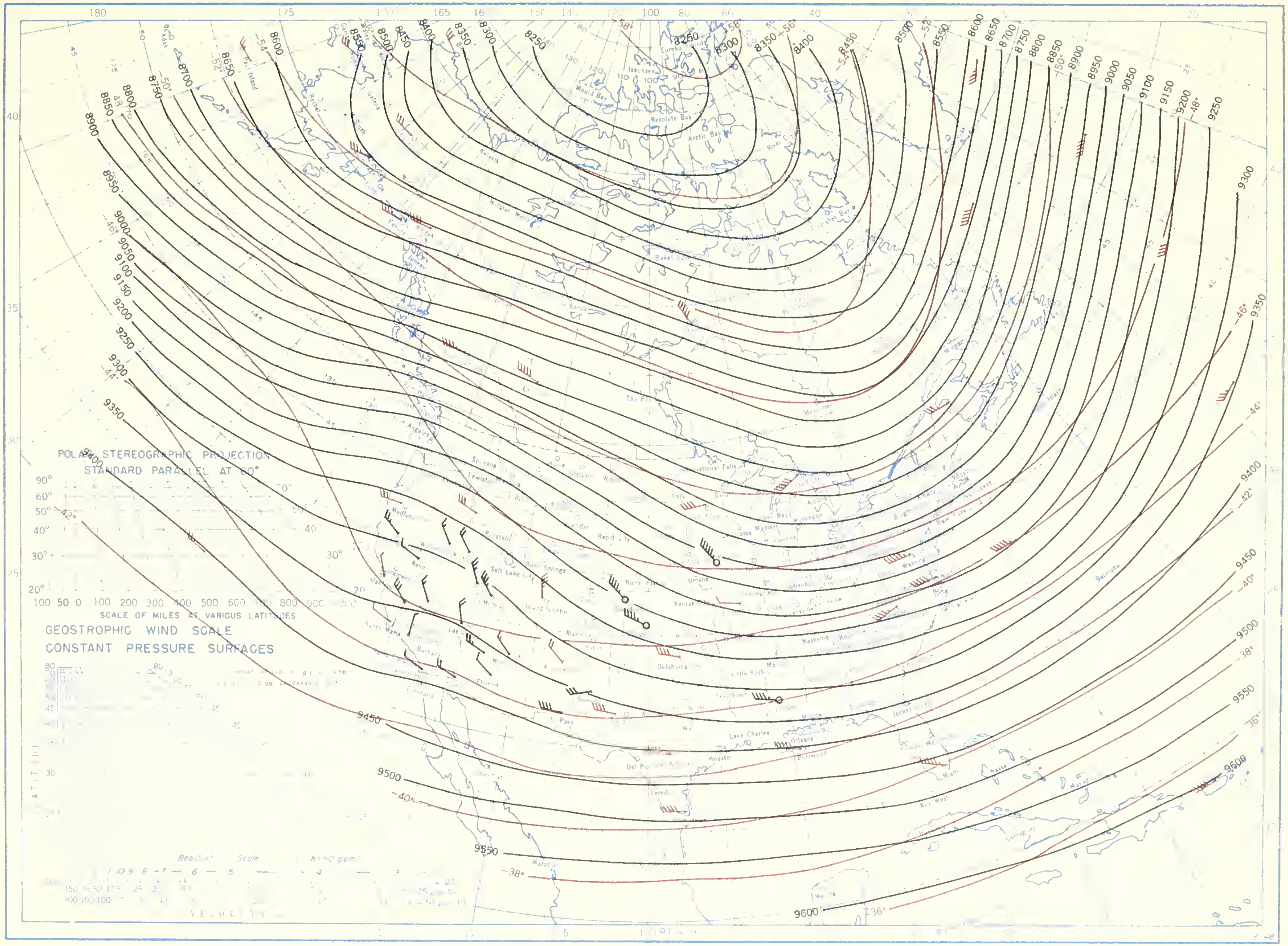
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), February 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 300-mb. Pressure Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), February 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

MARCH 1954
Volume 5 No. 3

ASHEVILLE: 1954

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NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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CLIMATOLOGICAL DATA
NATIONAL SUMMARY

Volume 5 No. 3 MARCH 1954

GENERAL SUMMARY OF WEATHER CONDITIONS

March 1954 was abnormally cold; in fact, for the first time in 62 years of record, it was colder than the preceding February. South Dakota experienced a striking example of this upset with a statewide average of 27.5°, which was 10.3° lower than the average for the preceding February. Frost or freezing in the Southeast during the first week and in most southern areas again about the middle of the month damaged some fruit and truck.

The nationwide precipitation average remained below normal for the second consecutive month. In the western portions of the central and lower Great Plains where no substantial precipitation had fallen since early December 1953, continued drought and soil-drifting winds further damaged small grains and pastures and reduced the overall crop outlook. Owing to the seriousness of the drought situation in Oklahoma, the entire State was designated a drought disaster area on March 23. However, beneficial rains fell in the far Southwest, and, although below normal, precipitation in the Mississippi and Ohio Valleys relieved somewhat the soil moisture shortage that had continued there since the fall of 1953.

Snowfall, unusually heavy for March in most sections of the North and far West, improved the potential water supply for the coming crop season in the latter area, but occasionally hampered transportation in the North-Central Interior. Measurable snow fell in some eastern sections of the Gulf Coastal Plain where snowfall is rare even in midwinter.

General cyclonic storms of unusual intensity moved across the central Great Plains and Great Lakes on the 11th and 12th, 18th and 19th, and 24th and 25th. Winds ranging up to more than 70 m.p.h. caused widespread minor damage. On the 25th Milwaukee, Wis., recorded a wind speed of 73 m.p.h. (an all time record for that station), and Escanaba, Mich., reported a record low pressure reading there for March - 28.92 inches (m.s.l.).

March sunshine exceeded 120 percent of normal at some points in the Pacific Northwest, but was near normal elsewhere.

PRECIPITATION.--In the western portions of the central and lower Great Plains precipitation totals were less than a quarter of an inch for March, less than an inch for the 15-week period ending March 29, and less than 50 percent of normal for each period. For Texas the average precipitation was only 0.41 inch, the second lowest average for March on record, and totals for the first quarter of the year (January-March) were the least on record for some western and southern stations--i.e., Lubbock (0.10 inch) and San Antonio (0.57 inch). By the end of March, 71 days had passed without measurable rain at Roswell, N. Mex.

In the central and lower Mississippi and lower Ohio Valleys as well as in parts of the Southeast, March precipitation totals generally exceeded an inch but were still less than 50 percent of normal. Most of the precipitation in these areas fell late in the month as moderate to heavy showers, and despite the subnormal monthly totals, improved topsoil moisture to the extent that it was generally adequate at the end of the month. Subsoil moisture remained low in many sections of the Mississippi and Ohio Valleys, however, and water hauling continued in parts of Iowa and southwestern Missouri.

In the far Southwest heavy precipitation, nearly all falling during the fourth week, was the most important feature of the month's weather in that region as it provided much needed moisture for pastures, truck, and small grains and helped to replenish water supplies. In southern California rainfall totals for the month exceeded 3 inches in agricultural areas and over 5 inches in the mountains. The statewide average for Arizona was 2.42 inches or 230 percent of normal, and individual station totals ranged up to 9.55 inches at Mount Lemmon in the southeast.

SNOWFALL.--March snowfall, while well above normal in most sections of the North and West, was less than half of normal east of the Appalachians southward from southern New England, in the lower Ohio and Missouri and Central Mississippi Valleys, and in an area in the Pacific Northwest including Washington, Idaho, and extreme western Montana. Boston, Mass., had only 6 percent of normal; Harrisburg, Pa., 3%; Cincinnati, Ohio, 15%; St. Louis, Mo., 50%; Lincoln, Nebr., 23%; and Spokane, Wash., 4%.

One of the worst and most extensive snowstorms of the month occurred in the North-Central Interior on the 11th, 12th, and 13th. Near-blizzard conditions occurred in parts of Colorado and Wyoming and thence eastward across the Great Plains to the Great Lakes. During the storm as much as 30 inches of snow fell in the Black Hills; Rapid City, S. Dak., reported 15 inches, Marshall, Minn., measured 11 inches, and up to a foot fell in northern Wisconsin. Severe drifting closed many secondary roads throughout the storm area. Odd features of this storm, brown snow and a sky with a hue described by observers as orange or yellowish brown, were caused by thick dust carried northeastward from the lower Great Plains by strong winds aloft. In parts of southern Michigan brown hail and muddy rain fell as well as brown snow.

The most unusual snowfall of the month occurred in the central and northeastern portions of the Gulf Coastal Plain on the 6th. In northwestern Florida depths of 4 inches were measured at the Milton Experiment Station, 3 inches at Niceville, a little over 2 inches at Pensacola, and traces of snow or sleet as far south and east as Panama City and Jacksonville. This was the heaviest snowstorm in Florida since February 1899 when depths ranged up to 4 inches at Lake Butler in Bradford County. In southern Alabama depths ranged up to 2 inches at Brewton and Mobile; at the latter city it was the greatest snowfall for March in 80 years of record and the greatest for any month since February 1899. Snow that blanketed the southern half of Mississippi with amounts ranging from traces in most places up to nearly 4 inches at Liberty, was the first March snowfall in that area since 1920 and the heaviest since February 14-15, 1895, when 6.3 inches fell at Biloxi.

TEMPERATURE.--Temperatures for March averaged below normal everywhere except along the Mexican Border from Texas to southeastern Arizona and in New England, New Jersey, and some adjacent areas, where they averaged slightly above normal. Extreme temperatures for the month, well within the limits of former records, ranged from -38° at Summit, Mont., on the 2d, to 108° at Rio Grande City, Tex., on the 31st.

Nearly all stations east of the Continental Divide recorded their lowest temperatures for the month during the first week when subzero minima were general over the North-Central Interior and extended southward in the Great Plains to eastern Colorado and western Kansas, and subfreezing extended almost to the Gulf. Lowest temperatures in northern New York and New England occurred on the 31st, in Washington State and the Columbia River Valley on the 28th or 29th, and elsewhere west of the Continental Divide on the 12th or 13th. On the latter date frost was general in Arizona where it caused some crop damage.

Damage to Florida's tender truck crops by frost and cold weather was unusually heavy for March. On the 2d, 5th, and 8th freezing extended into central areas and frost into the Everglades, and on the 16th and 17th heavy frost occurred in the north and light frost as far south as La Belle. The cold weather in the north portion and the inland areas of the central portion killed watermelons, cantaloupes, cucumbers, beans, sweet corn, and strawberry bloom, but cabbage, celery and other hardy plants survived. Tung bloom also suffered heavy damage.

The warmest weather east of the Mississippi occurred during the last week, in the upper Mississippi Valley on the 17th and 18th, and in most sections west of the Mississippi during the 2d week except at the end of the third week in western Washington, and the first week in western Oregon and most of California.

DESTRUCTIVE STORMS.--During March 1954 severe storms were directly or indirectly responsible for the death of at least 51 persons, injuries to over 270, and estimated property losses in excess of $26,000,000, more than half of which was caused by tornadoes.

On the 13th in the vicinities of Columbus and Macon, Ga., where heavy tornado destruction occurred in 1953, these storms struck again killing 8 persons, injuring at least 95, and causing property losses estimated at more than $14 million. Other tornadoes in east-central Missouri on the 24th and 25th caused $600,000 damage, and on the 28th one struck Anderson, Ind., where damage was estimated at $750,000.

High winds, snow, and dust in eastern Colorado on the 10th, 11th and 12th and again on the 17th and 18th were blamed for $5 million crop losses and $125,000 property damage.

Heavy snow and glaze resulted in $1,000,000 damage to power and communication lines in west-central Iowa on the 12th, $245,000 in eastern Kentucky on the 1st, and $150,000 in northeastern Nebraska on the 12th.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

MARCH 1954

Section	Temperature								Precipitation					
			Monthly extremes								Monthly extremes			
	Average	Departure from normal	Station	Highest	Date	Station	Lowest	Date	Average	Departure from normal	Station	Greatest	Station	Least
	°F.	°F.		°F			°F.		In.	In.		In.		In.
Alabama	54.6	-1.3	5 Stations	89	°24	Alexander City 6NE	19	7	3.61	-2.45	Thomasville	6.34	2 Stations	1.24
Arizona	49.0	-1.4	2 Stations	93	°9	Fort Valley	-6	18	2.42	+1.44	Mount Lemmon	9.55	Wellton	.07
Arkansas	50.8	-1.6	do	90	°11	2 Stations	10	4	2.06	-2.70	Fulton	3.93	Waldron	.44
California	48.8	-2.6	Indio US Date Garden	94	°5	Boca	-11	12	4.21	+.88	Cuyamaca	16.61	Calexico	.13
Colorado	33.3	-1.1	Eversoll Ranch	81	28	Taylor Park	-29	3	1.02	-.34	Wolf Creek Pass 4W	7.82	Monte Vista	T
Connecticut	37.7	+1.9	Waterbury	72	29	Cream Hill	9	5	3.88	-.24	Stevenson Dam	5.33	Waterbury	2.48
Delaware	43.6	.0	2 Stations	75	26	Laurel 2SW	16	6	3.93	+.07	Bridgeville	4.34	Selbyville	3.36
Florida	63.8	-1.6	Palatka	94	25	Compass Lake	26	7	2.43	-.92	Milton Exp. Sta.	5.47	Punta Gorda	.96
Georgia	56.2	-.8	Blackbeard Island	91	31	Blairsville Exp. Sta.	14	7	3.22	-1.77	Flat Top	9.35	Savannah Beach 2N	.73
Idaho	33.9	-1.8	Mountain Home	74	7	Island Park Dam	-25	3	1.52	-.16	Burke 2NNE	4.01	Howe	.17
Illinois	38.5	-2.5	2 Stations	79	°25	Aurora College	-1	6	2.56	-.64	Skokie	10.50	Chester	.75
Indiana	38.1	-2.4	Evansville	77	12	2 Stations	2	5	2.67	-1.05	Ogden Dunes	5.98	Johnson Exp. Farm	1.04
Iowa	32.4	-3.3	Missouri Valley	68	6	Clarion	-3	5	1.79	+.10	Keokuk	5.12	Glenwood	.35
Kansas	41.3	-2.8	2 Stations	86	11	2 Stations	0	3	.59	-.82	Emporia CAA AP	2.47	Liberal	.05
Kentucky	44.7	-1.7	Pikeville	88	25	do	7	°2	2.73	-2.04	Benham	7.17	Dunnville	.05
Louisiana	58.5	-1.3	Camp Polk	89	26	do	22	°14	2.27	-3.31	Hessmer	6.50	New Iberia 5NW	.66
Maine	29.2	+.1	Sanford 2NNW	62	29	Greenville	-13	31	3.47	-.04	Brunswick	5.06	Fort Kent	.95
Maryland	43.1	+.3	Hancock Fruit Lab.	80	30	Bittinger 2NW	7	4	3.87	+.26	Westernport	5.98	Charlotte Hall	2.45
Massachusetts	36.6	+1.4	5 Stations	71	°26	2 Stations	8	°12	3.49	-.43	Chester	4.96	Taunton	2.35
Michigan	28.5	-1.1	4 Stations	70	°25	do	-17	°15	2.62	+.58	Dowagiac	5.44	Atlanta 3ENE	.73
Minnesota	24.3	-1.6	Winona	61	18	do	-25	5	1.31	+.11	Mankato	2.61	Thief River Falls	.21
Mississippi	55.7	-1.2	2 Stations	89	31	Water Valley	18	4	3.04	-2.91	Alcorn A&M College	6.31	Sarah	.75
Missouri	42.6	-1.9	Ozark Beach	82	29	Hermitage	-1	4	2.03	-1.24	West Plains	4.75	Windsor	.68
Montana	25.2	-5.6	Miles City	73	10	Summit	-38	2	1.20	+.34	East Glacier	4.96	Canyon Creek 1W	.13
Nebraska	33.4	-3.0	Cambridge	76	10	Gordon 1 E	-13	3	1.08	-.05	2 Stations	2.94	Bloomington 2S	.05
Nevada	38.7	-2.8	Las Vegas	82	9	Sheldon	-4	12	1.27	+.36	Glenbrook	4.40	Montello	.11
New Hampshire	30.8	+1.7	2 Stations	68	29	First Conn. Lake	-12	31	3.83	+.50	Cannon Mt.	7.10	Bath 2SW	2.72
New Jersey	41.0	+1.5	do	75	29	Layton 3NW	12	9	3.75	-.09	Milton	5.15	Jersey City	2.35
New Mexico	43.8	-.4	Jal	88	°9	Gavlin	-16	12	.70	+.02	Batemans Ranch	4.85	16 Stations	.00
New York	32.1	+.5	Glenham	73	30	2 Stations	-10	31	3.52	+.37	Pulaski	9.21	Chazy 3E	1.21
North Carolina	49.9	-.6	2 Stations	89	°25	Banner Elk	8	4	5.04	+.07	Coweeta No. 8	11.50	Manteo	3.02
North Dakota	23.0	-1.7	Mott	67	10	Belcourt Indian Res.	-31	4	.84	+.06	Dickinson CAA AP	2.23	Tioga	.14
Ohio	37.4	-1.7	Chesapeake Huntg CAA AP	87	25	New Lexington 2NW	4	6	3.68	+.22	Chardon	8.16	Eaton	1.76
Oklahoma	49.1	-1.7	2 Stations	91	°24	Kenton	0	3	.72	-1.56	Wagoner	2.31	2 Stations	T
Oregon	38.6	-3.2	Brookings	75	1	Chemult	-7	12	2.20	-.70	Port Orford	10.76	Madras 2N	T
Pennsylvania	37.0	-.7	Donora	82	26	Clarion 3SW	4	6	4.14	+.58	Edinboro	7.23	Orwell 3N	2.03
Rhode Island	37.8	+1.1	2 Stations	69	°26	Kingston	16	12	3.40	-.70	Austin	4.73	Block Island WB AP	2.69
South Carolina	54.0	-.9	5 Stations	90	°25	Caesars Head	14	5	3.59	-.45	Sassafras Mt.	7.85	Beaufort 7SW	1.06
South Dakota	27.5	-3.8	Wasta	74	10	Deerfield Dam	-25	3	1.59	+.48	Deadwood	4.92	Cresbard 7 NW	.33
Tennessee	48.1	-1.4	Watauga Dam	89	26	Johnson City ETSC	8	2	4.04	-1.34	Haw Knob	8.60	Memphis WB City	1.36
Texas	56.6	-1.0	Rio Grande City	108	30	3 Stations	4	°3	.41	-1.36	Edom 1W	2.92	Several Stations	.00
Utah	37.0	-1.2	2 Stations	79	°9	Cove Fort	-9	13	1.61	+.25	Alta	8.85	Ibapah	.27
Vermont	29.1	+.2	Saint Albans	61	1	Lemington	-14	31	3.74	+.79	Searsburg Mt.	5.96	Saint Albans	2.39
Virginia	45.4	-.3	2 Stations	87	°25	Big Meadows	7	5	3.97	+.32	Natural Bridge Sta.	7.05	Speedwell	1.92
Washington	38.5	-3.0	Wawawai	70	9	Bumping Lake	-7	29	1.98	-1.03	Quinault RS	9.15	Ellensburg CAA AP	.28
West Virginia	40.5	-1.9	2 Stations	90	°25	2 Stations	-2	°5	4.24	+.33	Pickens 1	8.25	Cranberry Glades	2.47
Wisconsin	27.5	-1.0	Racine	68	25	Gordon 2ESE	-16	5	1.57	-.05	Racine	3.48	West Bend	.77
Wyoming	26.5	-3.4	Torrington Exp. Farm	72	10	Moran	-32	3	1.57	+.51	Snake River	4.99	Shoshoni	.11
Puerto Rico	74.2	+.6	Dos Bocas Dam	94	8	Jayuya	49	5	2.17	-1.28	Matrullas Dam	8.42	Josefa (2)	.00

° Other dates also.

Note: Dates in Table 1 apply to the period 24 hours prior to time of observation. In some cases the actual occurrence is on the calendar date preceding that shown. (See individual Climatological Data for times of observations).

CLIMATOLOGICAL DATA

State and station	Elevation (ground)	Pressure: Station	Pressure: Sea level	Temperature: Average maximum	Temperature: Average minimum	Temperature: Average	Temperature: Departure from normal	Temperature: Highest	Temperature: Date	Temperature: Lowest	Temperature: Date	No. of days: Max. 90° F. or above	No. of days: Min. 32° F. or below	Average dew point	Average relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Greatest in 24 hours	No. of days: .01 inch or more	No. of days: With thunderstorms	Snow, Sleet, Hail: Total	Snow, Sleet, Hail: Max. depth on ground	Wind: Average hourly speed	Wind: Prevailing direction	Fastest mile: Speed	Fastest mile: Direction	Fastest mile: Date	No. of days (sunrise to sunset): Clear	No. of days (sunrise to sunset): Partly cloudy	No. of days (sunrise to sunset): Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
ALABAMA																																
Birmingham	610	991.9	1017.2	65	42	53.4	-0.4	84	25	24	4	0	10	39	62	3.51	-2.80	1.20	9	2	0.0	0	7.8	S	33	SW	31	9	8	14	6.4	58
Mobile	211	1010.2	1018.4	68	48	58.4	-1.1	82	31	29	4	0	1	47	71	4.18	-3.08	2.09	9	2	1.6	1	13.2	SW	--	---	--	9	10	12	6.1	--
Montgomery CO	201	------	------	67	47	57.2	-.9	88	25	28	4	0	1	--	--	4.42	-1.98	1.63	7	2	T	0	----	---	--	---	--	--	--	--	---	--
Montgomery	198	1010.2	1017.7	68	45	56.6	-.5	89	25	28	4	0	4	43	65	4.67	-1.83	1.85	6	4	T	0	9.8	NW	30	NW	13	7	11	13	5.9	64
ARIZONA																																
Flagstaff	6993	------	------	46	19	32.3	-2.1	64	9	-1	18	0	30	--	--	3.90	+2.33	1.36	10	0	26.0	18	----	---	--	---	--	9	5	17	6.4	--
Phoenix	1114	974.3	1012.9	71	46	58.3	-1.6	84	9	32	13	0	1	36	47	1.22	+.56	.81	4	0	.0	0	5.7	SE	•30	W	°11	11	4	16	6.1	82
Prescott	5014	844.2	1013.8	57	29	42.8	-2.0	73	8	16	13	0	24	17	44	2.12	+1.14	.58	7	1	7.3	2	9.6	SW	65	SW	17	11	5	15	5.8	70
Tucson	2558	924.5	1012.6	72	47	59.3	+1.4	85	9	29	13	0	1	23	31	1.01	+.33	.41	5	0	T	0	7.5	SE	31	SW	17	10	6	15	6.1	82
Winslow	4880	849.0	1012.8	59	29	43.9	-1.6	76	9	13	12	0	21	16	39	.58	+.18	.30	5	0	1.8	1	10.7	WSW	•48	SW	23	11	7	13	5.5	--
Yuma	199	1008.1	1013.3	78	49	63.1	-2.6	91	9	39	13	2	0	28	31	.25	-.01	.24	3	0	.0	0	8.8	W	36	NW	17	12	9	10	5.0	84
ARKANSAS																																
Fort Smith	458	999.0	1016.1	62	38	49.7	-2.6	85	28	18	4	0	11	33	58	1.85	-1.24	.97	6	3	T	0	9.8	NE	38	SW	24	11	5	15	5.9	48
Little Rock	257	1003.1	1016.5	63	42	52.8	.0	85	11	25	4	0	6	35	56	2.14	-2.71	.85	7	3	.0	0	10.4	WNW	37	S	25	7	8	16	6.5	49
Texarkana	361	1002.7	1016.4	66	44	55.2	-.8	88	11	24	4	0	7	40	59	1.28	-3.65	.65	4	3	T	0	----	---	--	---	--	7	11	13	6.5	--
CALIFORNIA																																
Bakersfield	489	998.6	1016.7	67	44	55.3	-1.8	77	2	35	°11	0	0	42	65	1.24	+.13	.55	11	1	.0	0	4.9	N	•30	SE	16	9	9	13	5.7	--
Bishop	4108	872.3	1012.2	61	27	43.8	-3.6	73	27	15	18	0	26	--	--	1.00	+.34	.52	6	0	T	T	----	---	--	---	--	10	12	9	5.1	--
Blue Canyon	5280	835.4	1015.9	43	29	35.9	-2.8	55	°1	13	11	0	21	--	--	13.14	+5.68	4.33	15	1	65.0	25	----	---	--	---	--	8	6	17	6.6	--
Burbank	699	989.5	1015.8	65	45	55.1	-1.8	83	7	37	13	0	0	42	66	3.47	+1.22	1.16	9	0	T	T	5.4	S	•34	SSE	16	9	2	20	6.5	--
Eureka CO	43	1014.2	1017.1	53	41	47.2	-1.9	64	1	32	12	0	1	--	--	3.76	-.88	.74	15	1	T	T	6.7	---	32	SW	9	4	8	19	7.6	36
Fresno	331	1004.1	1016.0	63	41	51.8	-3.7	74	2	33	°13	0	0	42	73	2.90	+1.27	.68	10	1	T	T	5.4	NW	26	NW	10	9	9	13	6.1	69
Los Angeles CO	312	------	------	65	49	57.0	-1.9	76	7	43	17	0	0	43	66	2.99	+.63	.78	10	1	.0	0	6.8	---	37	NW	11	9	7	15	6.0	62
Los Angeles	99	1012.2	1015.9	63	48	55.7	-.8	70	°14	42	°13	0	0	45	72	2.60	+.69	.87	9	0	T	0	7.5	WSW	%45	S	16	8	5	18	6.1	--
Mt. Shasta	3543	889.6	1014.9	50	28	39.1	-2.6	66	°4	18	°12	0	25	--	--	3.70	-.38	1.51	12	0	21.7	9	----	---	--	---	--	11	7	13	6.0	--
Oakland	3	1016.3	1016.5	59	43	51.1	-2.3	74	1	34	13	0	0	41	71	2.69	+.38	.95	10	0	T	T	7.4	W	•35	W	10	8	7	16	6.5	--
Red Bluff	341	1002.7	1015.5	61	41	51.1	-3.2	75	1	34	12	0	0	37	65	4.07	+1.46	1.37	13	2	T	0	8.8	SSE	42	SE	9	9	9	13	5.9	65
Sacramento	17	1014.9	1015.8	61	40	50.8	-3.1	74	1	32	13	0	1	41	74	3.02	+.93	.74	10	1	T	T	9.7	SE	30	SW	°20	9	8	14	6.1	50
Sandberg CO	4517	860.5	1014.9	50	34	41.6	-3.1	67	8	21	11	0	19	--	--	1.25	-.56	.43	8	0	11.2	7	----	---	--	---	--	9	5	17	6.3	--
San Diego	19	1012.9	1016.2	64	50	57.2	-1.0	74	9	43	13	0	0	46	69	4.31	+2.79	1.80	11	0	T	T	7.2	WNW	36	W	16	8	10	13	6.1	57
San Francisco CO	52	------	------	57	47	52.1	-2.8	73	1	43	°10	0	0	--	--	4.56	+1.78	1.27	14	0	T	0	8.3	---	29	W	24	8	6	17	6.5	61
San Francisco	1	1015.6	1016.4	57	42	49.7	-3.1	71	1	33	13	0	0	44	80	4.37	+1.93	1.23	14	0	T	0	10.1	WNW	37	SW	9	7	6	18	6.6	--
Santa Maria	231	1008.1	1016.7	62	41	51.7	-2.3	73	8	31	13	0	1	43	75	3.44	+1.15	1.39	10	0	.0	0	8.1	WNW	•32	SE	16	9	8	14	5.9	--
COLORADO																																
Alamosa	7534	766.3	1014.3	48	16	31.8	.0	66	9	-1	3	0	29	--	--	.06	-.37	.06	2	0	.3	T	----	---	--	---	--	11	13	7	4.7	--
Colorado Springs	6175	805.6	1014.9	47	21	34.1	-2.7	68	9	-1	3	0	28	16	53	.59	-.10	.22	10	1	4.7	1	13.6	SSE	•60	WNW	18	7	11	13	6.1	--
Denver	5292	832.7	1013.0	49	22	35.3	-2.5	70	9	-5	3	0	27	15	50	.49	-.70	.30	7	0	6.3	4	11.3	S	45	NE	°12	8	8	15	6.2	63
Grand Junction	4849	856.4	1013.7	52	28	40.0	-1.2	67	10	15	°2	0	20	18	46	.87	.00	.24	9	1	3.1	1	9.0	ESE	65	S	23	9	10	12	5.9	56
Pueblo	4799	852.7	1013.5	53	24	38.5	-1.5	76	°9	-8	3	0	24	20	53	.32	-.38	.09	7	0	4.0	2	10.1	ESE	63	W	18	6	12	13	6.0	66
CONNECTICUT																																
Bridgeport	7	1011.9	------	48	32	39.8	+2.9	70	26	21	5	0	16	--	--	2.94	-.66	.97	8	0	T	T	----	---	--	---	--	8	12	11	5.7	--
Hartford	15	1006.4	1012.4	49	29	38.9	+2.0	69	29	20	5	0	25	25	61	3.50	-.03	1.00	10	0	T	T	11.0	NW	39	SE	1	6	10	15	6.4	63
New Haven	6	1008.1	1012.2	46	30	38.3	+1.2	67	26	20	5	0	24	--	--	3.98	-.14	1.23	8	0	.2	T	9.8	---	42	E	1	9	11	11	6.0	68
DELAWARE																																
Wilmington	73	1010.5	1013.7	51	32	41.5	-1.0	72	29	22	5	0	18	29	63	4.03	+.42	.96	11	1	.6	T	11.5	WNW	--	---	--	11	6	14	5.8	--
DIST. OF COLUMBIA.																																
Washington CO	72	------	------	54	36	44.7	-1.0	75	29	24	5	0	11	--	--	3.84	+.48	.96	12	--	T	T	9.6	---	34	W	21	--	--	--	----	--
Wash. Nat'l AP	14	1009.8	1014.2	54	35	44.5	-.8	75	29	24	5	0	12	29	57	3.47	+.44	.92	11	0	T	T	12.0	WNW	54	SE	1	10	9	12	5.5	57
FLORIDA																																
Apalachicola CO	13	1016.3	1017.6	66	53	59.6	-1.3	77	31	35	7	0	0	--	--	3.13	-1.79	1.73	5	2	.0	0	8.9	---	24	N	°19	15	2	14	5.1	57
Daytona Beach	31	1016.6	1018.2	74	51	62.1	-1.6	90	31	32	8	1	1	51	73	2.33	-1.29	.74	9	1	.0	0	11.2	NW	•24	NW	16	11	10	10	5.1	--
Fort Myers	15	1017.3	1017.9	78	54	65.9	-2.7	88	29	40	8	0	0	55	74	2.13	-.05	.91	6	0	.0	0	9.2	SW	•30	NW	19	17	7	7	4.2	--
Jacksonville CO	18	------	------	72	52	62.3	-1.1	90	25	36	4	1	0	--	--	1.62	-1.89	1.10	5	--	.0	0	----	---	--	---	--	--	--	--	----	--
Jacksonville	24	1016.9	1017.8	73	50	61.4	-.9	90	25	30	7	1	2	47	65	1.47	-1.95	1.02	4	0	T	0	9.6	SW	25	W	1	10	10	11	5.4	66
Key West	9	1015.9	1016.6	78	65	71.6	-2.1	85	°31	54	8	0	0	63	78	2.90	+1.33	1.84	3	0	.0	0	9.1	E	30	NW	15	13	12	6	4.2	76
Lakeland CO	214	------	------	75	54	64.5	-2.1	88	°31	35	7	0	0	--	--	1.05	-2.75	.50	5	1	.0	0	7.0	---	--	---	--	15	9	7	4.2	73
Miami CO	8	------	------	75	62	68.4	-2.4	85	14	47	°16	0	0	--	--	1.71	-.44	.71	5	0	.0	0	12.4	---	46	W	20	13	14	4	4.3	84
Miami	8	1016.3	1017.2	78	61	69.5	-1.8	89	14	46	2	0	0	59	71	1.96	-.29	.66	5	2	.0	0	10.6	N	•28	SSE	19	11	12	8	4.8	--
Miami Beach	9	------	------	77	64	70.5	-1.7	85	21	50	°16	0	0	--	--	1.99	-.30	.65	7	--	.0	0	----	---	--	---	--	14	3	14	----	--
Orlando	106	1013.5	1018.1	76	52	64.1	-2.6	90	31	35	2	1	0	52	71	.99	-2.27	.51	8	0	.0	0	10.5	S	•30	WNW	1	12	12	7	4.6	--
Pensacola CO	13	1015.6	------	67	51	58.9	-1.3	79	30	33	°6	0	0	--	--	3.50	-2.50	1.45	12	1	2.1	1	8.6	---	25	NE	27	9	5	17	6.5	63
Pensacola CAA AP	118	------	1017.9	--	--	----	---	--	--	--	--	--	--	49	--	----	----	----	--	--	----	--	12.0	NNW	--	---	--	--	--	--	----	--
Tallahassee	64	1015.2	1017.8	71	49	59.9	-.6	88	31	30	7	0	1	46	68	2.22	-2.85	1.15	8	1	T	0	6.9	NNW	--	---	--	12	7	12	5.4	--
Tampa	19	1017.6	1018.3	74	54	63.8	-2.2	85	31	37	7	0	0	53	74	2.01	-1.11	1.16	6	2	.0	0	10.2	N	•30	NW	1	13	11	7	4.8	79
West Palm Beach	15	1016.3	1017.1	78	59	68.4	-1.6	90	14	46	2	1	0	58	74	3.32	+.10	1.10	6	3	.0	0	11.6	SE	•30	NNW	6	12	11	8	5.0	--
GEORGIA																																
Albany	190	1010.5	1017.6	71	48	59.3	-.1	89	31	28	7	0	3	42	60	2.43	-3.03	1.14	6	3	T	0	6.7	NW	--	---	--	9	6	16	5.9	--
Athens	798	986.8	------	64	42	53.0	+.3	83	°30	25	7	0	10	--	--	2.93	-2.24	1.08	11	3	.0	0	----	---	--	---	--	9	10	12	5.6	--
Atlanta CO	1054	------	------	62	43	52.6	-.5	82	25	24	4	0	8	--	--	2.41	-3.08	.83	--	--	----	--	----	---	--	---	--	--	--	--	----	--
Atlanta	977	975.3	1017.3	64	43	53.1	+.4	82	12	25	4	0	8	38	62	3.07	-2.60	1.08	10	2	.0	0	12.6	NW	43	NW	3	10	6	15	6.3	59
Augusta	143	1009.8	1016.6	68	42	55.0	-1.5	87	25	23	7	0	9	41	65	3.23	-1.03	1.10	10	3	T	T	7.9	WNW	•25	WNW	14	7	10	14	6.1	--
Columbus	385	1003.1	1017.3	68	44	55.8	+1.1	87	°25	26	7	0	7	--	--	4.42	-1.39	1.78	6	3	.0	0	----	---	--	---	--	8	10	13	5.8	--
Macon	356	1002.4	1016.6	69	45	57.4	-.4	88	°31	27	°7	0	5	40	58	3.92	-1.19	1.44	9	2	.0	0	11.5	NW	60	S	13	9	9	13	5.9	66
Rome	637	993.9	1017.3	62	37	49.9	-1.8	82	12	19	7	0	15	--	--	5.70	-.13	1.42	9	4	T	0	----	---	--	---	--	10	6	15	6.4	--
Savannah	48	1014.9	1017.3	70	46	57.6	-1.4	90	31	25	7	1	7	45	67	1.42	-2.07	.76	7	2	T	0	9.7	WNW	28	NW	1	10	9	12	5.6	62
Valdosta	200	1009.5	1017.8	72	48	60.1	-.3	87	°31	30	7	0	6	46	--	1.78	-2.98	1.06	6	0	T	0	9.8	SW	--	---	--	10	8	13	5.4	--
IDAHO																																
Boise	2842	917.7	1015.3	51	28	39.3	-2.5	66	°7	13	2	0	25	24	57	1.20	-.14	.50	8	0	1.2	1	10.9	SE	40	NW	11	11	6	14	5.7	56
Lewiston	1413	963.8	1016.3	51	29	40.0	-3.6	65	9	17	29	0	24	--	--	1.21	+.07	.86	4	0	T	T	----	---	--	---	--	6	10	15	6.5	--
Pocatello	4444	858.8	1014.8	44	24	34.0	-2.6	60	7	8	13	0	27	22	64	1.02	-.11	.20	11	1	7.2	2	11.6	SW	40	W	26	7	5	19	7.1	52
ILLINOIS																																
Cairo CO	314	1003.1	------	58	38	47.6	-1.4	77	12	23	4	0	9	--	--	2.14	-2.58	.82	8	2	T	T	10.1	---	35	SW	25	8	6	17	6.4	54
Chicago	610	991.9	1015.5	43	27	35.0	-2.0	68	25	7	5	0	20	22	63	5.00	+2.15	2.30	13	3	19.9	12	11.9	NW	51	W	25	9	3	19	6.3	55
Moline	589	993.9	1017.0	43	25	34.0	-3.2	64	18	9	4	0	24	24	68	3.13	+.65	2.05	13	3	2.2	2	11.3	NW	66	SW	25	8	7	16	6.1	52
Peoria	654	993.2	1016.3	44	27	35.4	-2.9	66	25	4	5	0	22	24	66	3.41	+.62	1.86	10	2	4.3	4	13.2	---	52	SW	25	10	5	16	6.1	57
Springfield	587	992.9	1016.8	48	28	37.8	-2.4	70	28	5	5	0	19	27	68	1.54	-1.77	.54	9	2	2.0	2	15.7	NW	49	SW	25	9	6	16	6.2	53
INDIANA																																
Evansville	383	1001.0	1017.0	55	33	43.7	-2.9	76	12	17	6	0	17	31	64	1.50	-2.79	.53	7	1	T	T	11.9	WNW	38	SW	25	10	5	16	6.3	60
Fort Wayne	801	982.7	1014.6	44	26	34.9	-1.9	68	25	10	°4	0	26	25	71	2.64	-.52	1.09	10	4	2.5	1	15.4	W	52	SW	25	7	6	18	6.6	47
Indianapolis	793	985.8	1015.9	48	28	37.6	-2.5	70	28	12	°4	0	22	26	66	2.99	-.90	.83	12	6	1.4	1	14.3	WNW	56	NW	3	8	7	16	6.5	58
South Bend	768	986.1	1015.1	42	25	33.3	-2.4	69	25	9	5	0	28	24	71	4.03	+1.08	2.26	14	4	14.2	5	14.0	SW	•47	SW	25	6	5	20	7.3	--

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
INDIANA (Cont.)																																
Terre Haute	578	994.9	1016.2	49	29	38.7	-2.9	72	°25	12	5	0	22	28	69	1.77	-2.14	0.47	11	7	2.0	2	13.6	WNW	49	SW	25	6	12	13	6.5	42
IOWA																																
Burlington	694	990.9	1017.0	45	26	35.5	-3.0	64	18	8	5	0	23	24	66	3.48	+.67	2.30	11	2	.5	T	12.9	WNW	45	W	25	8	9	14	6.2	63
Des Moines	948	985.1	1017.4	42	24	33.2	-3.8	61	°17	6	3	0	24	23	68	1.86	-.17	.80	9	1	5.4	4	15.9	NW	54	W	18	8	7	16	6.5	55
Dubuque	1065	976.6	1017.0	40	21	30.8	-2.5	59	18	5	5	0	29	20	65	1.79	-.46	.52	8	1	8.4	6	----	---	--	---	--	9	6	16	6.6	--
Sioux City	1094	974.6	1017.3	39	23	31.0	-4.0	61	17	5	3	0	25	22	71	2.08	+.82	.51	11	1	11.3	8	14.3	NNW	45	E	12	9	6	16	6.5	48
KANSAS																																
Concordia CO	1375	964.8	------	50	28	38.6	-3.0	70	10	10	3	0	20	--	52	.09	-1.24	.05	3	2	T	T	9.8	---	30	N	13	11	11	9	5.0	65
Dodge City	2594	925.2	1014.5	54	27	40.2	-2.4	79	11	8	3	0	21	22	55	.24	-.91	.23	3	0	T	T	16.9	S	61	N	18	10	9	12	5.5	69
Goodland	3645	884.5	1014.1	48	20	34.0	-2.5	70	°9	0	3	0	30	18	61	1.28	+.19	.73	7	0	12.8	5	14.4	S	•47	NW	12	7	9	15	6.2	--
Topeka	879	980.0	1016.5	53	29	41.0	-1.6	71	°27	13	4	0	19	25	57	.63	-1.40	.50	3	2	T	T	11.9	WNW	60	S	18	10	4	17	6.3	50
Wichita	1321	965.8	1015.4	55	31	42.6	-2.7	79	11	13	4	0	16	25	56	1.30	-.44	.99	2	2	T	T	14.7	N	44	SW	24	11	3	17	6.1	69
KENTUCKY																																
Lexington	978	979.7	1016.1	54	32	42.8	+.4	73	25	13	5	0	16	30	65	2.38	-2.08	.75	11	2	T	1	15.4	SSE	--	---	--	8	6	17	6.8	--
Louisville CO	457	------	------	53	34	43.6	-2.5	71	°25	18	4	0	14	--	--	2.08	-2.59	.74	9	2	T	0	----	---	--	---	--	--	--	--	---	--
Louisville	474	999.0	1015.5	54	33	43.7	-1.9	73	28	18	4	0	16	31	63	1.25	-3.42	.38	8	2	T	0	10.4	NW	45	SW	25	10	6	15	6.2	58
LOUISIANA																																
Baton Rouge	64	1013.9	1016.9	71	49	59.8	-.5	85	31	31	7	0	2	48	68	2.01	-3.81	.83	11	1	T	0	10.9	S	--	---	--	8	8	15	6.1	--
Lake Charles	12	1015.6	1015.6	69	49	59.1	-1.5	83	19	34	°1	0	0	48	71	2.37	-2.39	.57	7	1	T	0	10.5	N	--	---	--	6	7	18	6.9	--
New Orleans CO	9	1015.2	------	70	53	61.1	-1.9	86	31	38	°4	0	0	--	--	2.94	-3.62	1.17	11	0	.0	0	7.9	---	20	S	25	8	9	14	6.5	64
New Orleans	3	1015.2	1017.3	70	51	60.2	-1.5	86	31	33	7	0	0	49	71	2.22	-3.68	1.30	11	1	.0	0	12.4	S	•30	S	25	8	12	11	6.1	--
Shreveport	252	1007.1	1016.8	68	46	56.7	-1.2	87	11	29	14	0	6	43	65	1.49	-3.21	.52	6	5	T	T	10.9	S	--	---	--	7	7	17	6.8	62
MAINE																																
Caribou	624	984.8	1008.7	31	14	22.4	+.7	47	1	0	31	0	31	15	70	1.28	-1.12	.32	17	0	11.7	13	13.6	WNW	40	WNW	18	4	10	17	7.1	--
Portland	61	1006.4	1010.5	41	22	31.6	+.1	60	29	13	12	0	28	22	69	3.97	-.06	2.01	13	0	12.1	8	11.3	W	44	SE	3	10	7	14	6.0	62
MARYLAND																																
Baltimore CO	14	------	------	54	37	45.5	+.2	77	29	24	°5	0	9	--	--	4.45	+.82	1.42	12	--	----	--	----	---	--	---	--	--	--	--	---	--
Baltimore	146	1009.5	1014.4	52	32	41.9	-1.3	76	29	22	5	0	18	27	59	3.96	+.33	1.17	12	1	1.5	T	12.0	WNW	52	W	3	10	10	11	5.5	65
Frederick	294	------	------	51	29	40.4	-2.9	74	29	20	6	0	22	--	--	3.00	-.31	1.12	11	--	1.0	1	----	---	--	---	--	--	--	--	---	--
MASSACHUSETTS																																
Blue Hill Obs.	636	987.1	------	45	27	35.1	+1.0	68	29	16	5	0	24	--	63	3.51	-.35	1.00	11	0	3.1	3	18.0	WNW	•50	SSE	3	12	9	10	5.2	57
Boston	12	1006.4	1011.2	47	31	38.8	+1.2	70	29	21	5	0	18	22	57	3.33	-.10	.95	10	0	.4	T	14.9	WNW	45	S	3	11	8	12	5.4	70
Nantucket	43	1011.2	1011.6	44	31	37.4	+.8	53	26	23	5	0	22	28	70	2.62	-1.43	1.20	9	0	.5	T	14.1	WNW	50	SE	3	7	10	14	6.2	61
Pittsfield	1153	966.5	1009.1	40	23	31.8	+1.0	56	29	15	°16	0	29	--	--	3.53	+.31	1.08	13	--	3.7	3	----	---	--	---	--	--	--	--	---	--
MICHIGAN																																
Alpena CO	587	990.5	------	34	19	26.7	-1.0	59	25	7	°3	0	30	--	--	1.45	-.59	.34	16	0	19.7	9	13.1	---	50	SE	25	5	8	18	7.1	54
Detroit	619	986.5	1014.0	41	26	33.5	-1.6	69	25	13	6	0	26	23	69	3.87	+1.34	1.81	11	3	15.5	7	13.3	WNW	56	W	25	7	5	19	6.6	50
Escanaba CO	594	991.5	------	33	19	26.0	-.2	47	25	6	°3	0	30	--	--	1.70	-.08	.98	10	1	8.4	6	12.4	---	49	N	20	8	11	12	6.3	62
Grand Rapids	681	988.8	1014.6	40	22	31.0	-1.5	68	25	1	30	0	28	23	73	4.83	+2.48	2.96	14	3	21.9	8	13.1	WNW	57	SW	25	6	4	21	7.2	44
Lansing	859	981.7	1014.7	39	23	30.7	-2.5	67	25	6	30	0	28	22	73	3.25	+.68	1.59	16	1	13.8	8	15.2	WNW	50	W	25	6	11	14	6.4	55
Marquette CO	677	987.1	------	33	20	26.5	-.4	55	18	5	3	0	29	--	--	2.20	+.15	.65	16	0	21.2	20	9.8	---	26	NW	2	7	5	19	7.3	50
Muskegon	627	991.2	1015.0	38	25	31.3	-1.1	61	25	7	30	0	29	22	67	3.03	+.85	1.22	13	2	17.3	4	----	---	--	---	--	7	4	20	7.1	--
Sault Ste. Marie	721	990.5	1013.9	30	14	21.7	-1.3	45	18	-1	4	0	31	17	82	1.48	-.37	.37	16	0	14.6	13	11.3	NW	36	SW	25	6	7	18	6.9	48
Ypsilanti	722	984.8	1013.9	42	25	33.5	-2.0	68	25	7	6	0	27	23	69	4.39	+2.04	2.35	9	1	15.0	6	13.0	WNW	•40	W	25	5	10	16	6.6	--
MINNESOTA																																
Duluth	1409	974.3	1017.3	30	11	20.1	-2.1	44	18	-9	5	0	31	12	68	1.83	+.05	.86	10	1	12.4	18	14.2	NW	40	NE	12	9	9	13	6.0	65
Intern'l Falls	1179	973.2	1018.8	28	5	16.8	-3.2	43	17	-19	5	0	31	8	66	.81	-.22	.26	10	0	10.1	18	10.6	---	--	---	--	10	8	13	5.6	--
Minneapolis	830	983.1	1018.2	36	20	27.9	-3.0	53	°6	1	3	0	29	16	69	2.10	+.62	.78	11	2	10.7	7	13.2	NW	46	E	12	9	8	14	5.9	53
Rochester	1017	978.3	1017.1	38	19	28.0	-2.4	55	°6	2	°3	0	29	16	63	1.88	+.33	.60	11	1	10.4	7	11.7	NW	--	---	--	8	8	15	6.5	--
St. Cloud	1034	978.3	1017.9	34	15	24.2	-2.7	48	17	-3	°3	0	30	16	71	1.62	+.47	1.03	11	0	11.8	7	8.2	NW	--	---	--	5	12	14	6.5	--
MISSISSIPPI																																
Jackson	315	1004.7	1017.0	68	44	56.1	-.7	85	°11	26	4	0	7	42	63	2.91	-3.32	1.58	8	4	T	0	9.5	SSW	35	SW	12	9	10	12	6.1	59
Meridian	294	1003.4	------	69	43	55.8	-.7	85	°12	27	°4	0	9	--	--	4.37	-2.21	2.05	8	3	.0	0	----	---	--	---	--	10	7	14	5.6	--
Vicksburg CO	234	1007.5	------	67	47	57.0	-1.1	83	°11	28	4	0	2	--	--	2.74	-3.29	.95	7	4	T	0	9.9	---	32	SE	27	8	8	15	6.3	57
MISSOURI																																
Columbia	778	988.2	1016.1	52	30	41.2	-1.6	78	12	14	4	0	16	26	59	1.20	-1.81	.64	6	3	1.5	2	12.4	NW	42	SE	°18	7	11	13	6.1	65
Kansas City	741	980.7	1016.5	52	32	41.7	-2.1	72	12	15	3	0	16	25	56	1.62	-.89	1.37	4	2	T	T	12.0	WNW	50	SW	12	11	3	17	6.2	55
St. Joseph	809	980.4	1016.3	50	28	39.1	-2.8	67	27	11	4	0	19	23	56	1.45	-.76	1.17	4	2	T	T	13.6	---	52	W	25	10	5	16	6.1	58
St. Louis CO	465	995.9	------	53	34	43.2	-2.1	77	°12	16	4	0	14	--	--	1.10	-2.54	.48	8	3	1.8	1	12.7	---	65	SW	25	9	9	13	5.9	63
St. Louis	552	995.9	1016.3	53	32	42.1	-2.3	78	°12	14	4	0	15	27	59	1.14	-2.28	.48	8	2	1.0	1	11.0	NW	--	---	--	8	10	13	6.0	--
Springfield	1265	967.2	1015.7	53	33	43.1	-1.8	77	28	14	°3	0	14	31	66	1.56	-1.60	.82	6	3	2.8	2	14.1	SSE	50	SW	12	9	6	16	6.5	58
MONTANA																																
Billings	3568	889.6	1017.4	37	18	27.4	-6.7	63	°9	-2	29	0	28	18	71	2.70	+1.77	.71	14	0	27.1	10	11.7	SW	46	NW	26	4	11	16	7.1	58
Glasgow CO	2090	942.4	1020.2	33	13	23.0	-5.9	60	9	-10	2	0	30	15	72	1.37	+.77	.92	10	0	11.2	4	----	---	--	---	--	5	7	19	7.3	--
Great Falls	3664	887.2	1018.0	36	16	25.9	-6.6	60	9	-7	28	0	29	16	69	1.01	+.02	.35	16	0	13.8	6	13.1	SW	42	W	14	6	6	19	6.9	51
Havre CO	2488	927.5	1020.4	34	14	23.9	-6.4	60	9	-6	2	0	30	--	--	1.05	+.35	.46	9	0	15.9	8	7.3	---	31	SW	5	8	4	19	7.0	48
Helena	3893	871.3	1018.0	39	16	27.4	-4.8	61	9	-10	29	0	30	16	63	.46	-.26	.15	8	0	8.9	4	7.6	WNW	45	W	26	6	7	18	6.6	64
Kalispell	2965	------	------	40	19	29.6	-4.1	52	16	1	28	0	28	--	--	.69	-.32	.33	8	0	3.2	3	----	---	--	---	--	8	8	15	6.4	--
Miles City	2629	931.6	1018.7	38	16	26.7	-4.5	69	10	-6	3	0	29	19	--	.90	+.20	.33	8	0	10.4	4	11.2	NW	--	---	--	6	7	18	7.1	--
Missoula	3200	900.4	1017.3	43	22	32.2	-2.5	57	16	4	2	0	28	19	59	.48	-.35	.31	7	0	1.4	1	7.4	W	3[illegible]	N	27	6	7	18	7.0	53
NEBRASKA																																
Grand Island	1841	948.2	1016.2	45	24	34.1	-3.5	66	10	6	4	0	23	22	65	.60	-.68	.31	7	2	1.0	1	14.0	NNW	--	---	--	9	6	16	6.5	--
Lincoln CO	1184	------	------	45	26	35.8	-3.6	66	6	8	4	0	22	--	--	.66	-.81	.25	9	1	1.2	1	10.9	---	34	NW	25	--	--	--	---	59
Lincoln	1180	------	------	45	24	34.9	-3.6	66	6	8	4	0	24	22	--	.48	-.78	.24	7	0	.8	T	13.3	N	--	---	--	8	9	14	6.2	--
Norfolk	1544	960.0	1017.6	40	21	30.2	-4.7	62	°6	3	°4	0	26	22	70	1.31	-.24	.39	9	1	7.0	4	----	---	--	---	--	9	5	17	6.6	--
North Platte	2779	913.6	1015.0	45	20	32.2	-4.2	72	10	1	3	0	29	21	67	.60	-.31	.36	8	0	7.9	4	12.7	NNW	50	N	12	9	4	18	6.8	56
Omaha	978	976.0	1017.2	45	26	35.1	-3.1	65	6	9	3	0	23	23	64	.71	-.61	.27	8	1	2.9	2	14.7	NW	42	E	12	8	8	15	6.4	50
Scottsbluff	3950	876.1	1015.6	43	17	30.3	-4.6	69	10	-5	3	0	30	17	64	2.20	+1.32	.89	9	0	22.0	8	12.5	NW	--	---	--	7	5	19	7.0	--
Valentine CO	2581	921.8	------	39	18	28.4	-5.3	68	10	-4	3	0	27	--	--	1.91	+.66	1.03	[illegible]	0	13.1	10	9.8	---	34	N	12	6	4	21	7.2	60
NEVADA																																
Elko	5075	841.5	1014.5	47	19	33.0	-3.1	63	7	3	°18	0	29	21	64	1.72	+1.03	.82	11	0	17.0	11	7.2	SW	•35	WNW	10	9	3	19	6.7	--
Ely	6257	803.9	1013.8	45	18	31.8	-3.5	61	7	-1	31	0	29	17	59	1.37	+.08	.86	10	0	16.6	10	11.9	---	47	SW	10	8	8	15	5.9	69
Las Vegas	2162	946.8	1012.4	65	40	52.2	-4.3	78	9	28	13	0	4	20	33	.81	+.46	.69	5	1	.0	0	12.3	SW	•52	SSW	16	14	8	9	4.3	80
Reno	4397	858.8	1014.7	51	23	37.3	-3.3	64	°5	11	12	0	29	22	58	1.81	+1.11	.96	8	0	13.1	5	6.9	S	49	SE	9	10	8	13	5.6	54
Winnemucca	4299	864.9	1014.9	50	21	35.5	-3.9	67	7	-3	12	0	28	22	60	.92	+.06	.26	10	0	6.9	2	9.0	---	45	W	9	9	3	19	6.5	64

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature								No. of days		Average dew point	Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
																			No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below			Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F	°F	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
NEW HAMPSHIRE																																
Concord	339	1000.0	1010.8	42	23	32.7	+0.9	61	29	15	12	0	28	21	65	2.95	-0.09	1.06	14	0	6.3	5	9.2	NW	35	W	26	10	7	14	5.8	57
Mt. Washington	6262	791.7	------	16	1	8.8	-3.2	36	1	-12	5	0	31	--	89	6.16	+.61	1.35	29	0	39.3	14	47.1	W	%110	WSW	26	5	5	21	7.8	28
NEW JERSEY																																
Atlantic City CO	8	1011.5	1013.5	49	35	42.0	+.5	71	26	23	5	0	12	--	--	2.72	-.81	.66	10	1	T	T	17.2	---	47	SE	3	11	8	12	5.6	65
Newark	11	1011.5	1012.7	50	33	41.3	+.8	74	29	22	5	0	15	26	57	3.38	-.40	.83	8	0	T	T	12.9	WNW	•42	WNW	3	8	10	13	5.9	--
Trenton CO	56	1006.1	1013.2	50	33	41.6	+.3	71	29	22	°5	0	15	--	--	4.16	+.96	1.04	9	1	.1	T	11.2	---	•34	NW	26	10	7	14	5.9	62
NEW MEXICO																																
Albuquerque	5310	845.9	1011.7	59	33	46.0	.0	77	9	16	3	0	17	18	38	.24	-.20	.18	4	2	T	T	9.3	W	54	NW	18	11	8	12	5.5	72
Clayton	4969	841.2	1012.4	55	25	40.3	-1.2	76	28	5	3	0	25	--	--	.35	-.31	.24	4	0	3.3	3	----	---	--	---	--	12	10	9	5.1	--
Roswell	3612	890.6	1012.4	67	36	51.4	+.7	84	°10	17	3	0	12	12	26	T	-.53	T	0	0	T	T	13.7	---	61	SW	11	11	10	10	5.1	--
NEW YORK																																
Albany	277	1008.1	1011.7	43	26	34.4	+1.3	61	1	19	°31	0	28	21	62	2.69	+.36	1.07	12	1	2.2	1	12.1	WNW	43	NW	26	7	10	14	6.5	47
Binghamton	858	950.9	1010.0	38	22	29.6	-1.5	55	1	10	5	0	30	21	70	2.66	-.33	.46	17	1	13.7	3	14.5	WNW	59	S	1	4	5	22	7.6	49
Buffalo	693	983.4	1012.6	41	25	32.9	-.1	65	25	13	4	0	27	23	69	5.24	+2.52	2.14	15	2	26.3	14	16.1	SW	56	SW	°2	4	9	18	7.3	48
New York CO	10	1000.3	------	48	34	41.2	+.5	66	29	21	5	0	13	--	--	3.02	-.54	.66	8	0	T	0	16.6	---	65	SE	1	10	6	15	5.6	65
New York	19	1011.2	1012.9	50	35	42.1	+1.6	67	°29	22	5	0	11	25	55	3.80	+.30	1.18	8	0	T	0	16.2	WNW	54	SE	1	8	10	13	5.8	--
Rochester	543	992.6	1012.2	40	24	32.1	-.9	62	1	13	31	0	29	25	77	4.09	+1.13	1.28	16	2	23.0	16	13.2	WSW	62	W	3	4	10	17	7.1	41
Schenectady	217	------	------	43	28	35.2	+2.7	60	1	21	°7	0	24	--	--	2.80	+.11	.69	12	1	3.3	3	----	---	--	---	--	14	11	6	---	--
Syracuse	424	990.2	1012.8	42	25	33.3	-.9	63	1	16	31	0	27	23	67	3.48	+.24	1.50	18	1	18.4	12	11.5	WSW	45	SE	1	5	7	19	7.4	47
NORTH CAROLINA																																
Asheville CO	2203	------	------	56	35	45.7	-1.1	82	25	17	4	0	16	--	--	5.11	+1.54	1.56	11	4	1.8	4	10.2	---	37	NW	15	8	13	10	5.5	66
Asheville	2093	941.1	1016.1	--	--	----	----	--	--	--	--	--	--	35	72	----	----	----	--	--	----	--	6.5	NNW	--	---	--	--	--	--	---	--
Charlotte	753	988.2	1015.6	61	39	49.9	-1.1	83	30	20	7	0	12	35	63	6.94	+2.85	2.78	14	4	T	0	7.4	SW	29	NW	1	9	10	12	6.1	67
Greensboro	891	983.4	1015.9	59	36	47.4	-.8	80	80	21	6	0	14	33	63	4.00	+.35	1.36	12	5	.0	0	9.5	SW	28	SW	25	9	10	12	6.0	60
Hatteras	4	1014.6	1015.4	60	47	53.1	+.4	72	°30	35	5	0	0	44	72	4.49	+.60	1.70	10	3	.0	0	13.7	SSW	49	SW	14	8	7	16	6.4	48
Raleigh CO	400	------	------	61	39	49.7	-1.6	82	25	25	°7	0	9	--	--	5.23	+1.65	1.38	12	3	.0	0	7.2	---	29	SW	1	11	8	12	5.5	55
Raleigh	438	999.7	1015.6	61	37	49.1	-1.0	82	25	22	°7	0	11	34	61	4.49	+.83	1.20	12	4	.0	0	8.6	SW	--	---	--	10	9	12	5.9	--
Wilmington	30	1014.9	1016.3	65	43	53.8	-.9	84	30	26	7	0	7	--	--	4.97	+1.52	1.16	13	4	.0	0	10.7	---	40	W	3	11	7	13	5.5	67
Winston-Salem	967	980.0	1015.7	59	38	48.2	-.3	80	30	23	°5	0	11	30	55	4.65	+.82	1.39	12	6	T	0	10.3	WNW	•32	SW	25	10	9	12	5.8	--
NORTH DAKOTA																																
Bismarck	1650	956.7	1019.1	34	14	23.9	-3.0	55	8	-11	4	0	31	17	76	.89	+.13	.33	12	0	9.8	3	11.4	WNW	36	NW	8	8	8	15	6.3	61
Devils Lake CO	1471	963.8	------	31	14	22.5	-.1	49	23	-12	4	0	31	--	--	.52	-.21	.28	9	0	5.8	2	9.9	---	29	N	25	11	7	13	5.5	70
Fargo	895	982.7	1018.9	33	18	25.5	+.2	49	17	-2	4	0	29	18	73	.65	-.24	.27	5	0	4.9	2	15.9	N	45	NW	25	9	7	15	6.2	55
Williston CO	1877	949.2	1019.7	32	14	22.6	-3.9	52	9	-9	3	0	31	16	75	1.02	+.27	.63	9	0	9.9	5	7.7	---	26	E	11	3	7	21	7.8	53
OHIO																																
Akron	1210	975.6	1014.7	42	25	33.6	-2.9	68	25	9	°5	0	26	25	75	4.16	+1.00	1.73	14	3	14.0	6	12.3	NW	--	---	--	5	8	18	7.0	--
Cincinnati Obs.	761	------	------	51	31	41.0	-2.3	70	25	16	4	0	18	--	--	2.41	-1.66	.89	12	5	.4	2	8.7	---	31	W	3	--	--	--	---	46
Cincinnati	869	983.1	1015.6	50	30	39.7	-2.0	69	25	15	°4	0	19	27	63	2.41	-1.63	.82	9	3	.6	1	12.3	WNW	34	SSW	25	6	9	16	6.9	--
Cleveland CO	663	------	------	43	29	36.3	-1.4	70	25	13	6	0	22	--	--	5.65	+2.69	1.95	13	--	----	--	----	---	--	---	--	--	--	--	---	--
Cleveland	787	985.8	1014.1	44	27	35.1	-1.7	70	25	10	°5	0	26	26	73	6.07	+3.18	2.33	13	2	26.3	15	13.3	SW	46	W	3	6	5	20	7.1	48
Columbus CO	724	------	------	47	31	39.0	-2.1	70	25	18	°4	0	19	--	--	2.54	-.68	.90	10	--	5.4	4	----	---	--	---	--	--	--	--	---	--
Columbus	815	984.4	1015.2	48	28	37.8	-2.0	70	25	16	°4	0	25	27	69	2.82	-.61	1.02	11	1	5.5	4	11.3	WSW	52	S	28	9	4	18	6.8	50
Dayton	1002	978.0	1015.1	47	28	37.4	-2.4	67	°25	13	6	0	23	27	70	2.13	-1.11	.74	12	2	1.8	1	12.3	WNW	5[illegible]	W	3	6	8	17	7.0	60
Portsmouth CO	715	------	------	55	33	43.9	+.9	85	25	19	6	0	17	--	--	2.13	-1.10	.77	12	6	6.2	8	8.1	---	6[illegible]	SW	3	--	--	--	---	--
Sandusky CO	603	991.2	------	44	29	36.4	-1.1	70	25	15	°4	0	24	--	--	4.50	+1.61	1.70	12	4	11.1	7	10.6	---	42	NW	3	8	11	12	5.9	60
Toledo	622	990.5	1014.3	44	25	34.1	-1.7	68	25	10	6	0	28	25	73	4.04	+1.18	1.72	10	3	14.6	6	14.7	W	4[illegible]	SW	25	6	7	18	6.8	47
Youngstown	1178	970.5	1014.1	43	24	33.6	-3.1	68	25	10	6	0	26	24	72	4.71	+1.26	2.47	12	3	10.1	3	12.5	WSW	•45	WSW	3	4	10	17	7.3	--
OKLAHOMA																																
Oklahoma City	1280	971.6	1015.8	59	36	47.5	-2.2	81	°11	16	3	0	12	28	53	.67	-1.42	.43	6	1	1.7	1	16.1	SSE	61	S	24	1[illegible]	9	12	5.8	60
Tulsa	672	990.9	1015.6	59	37	48.2	-1.7	85	11	18	4	0	12	30	54	1.54	-1.07	1.00	4	2	.3	T	12.8	S	43	SW	°12	[illegible]	5	18	6.4	55
OREGON																																
Astoria	12	1015.9	1017.0	52	33	42.8	-2.5	60	°3	27	12	0	17	34	74	4.17	-3.08	1.60	15	0	1.0	1	7.1	SE	--	---	--	9	10	12	6.1	--
Burns CO	4140	870.0	1014.9	47	23	35.3	-3.6	64	7	10	18	0	28	21	58	1.01	+.24	.56	8	0	5.4	2	----	---	--	---	--	11	4	16	6.0	--
Eugene	361	1002.4	1016.2	54	32	42.7	-4.0	62	25	27	°3	0	22	34	73	2.90	-.96	.86	9	0	1.5	1	8.2	N	•32	W	9	8	8	15	6.2	--
Meacham	4050	------	------	40	22	31.0	-3.0	56	5	7	29	0	29	--	--	1.50	-2.91	.42	9	1	12.6	4	----	---	--	---	--	6	10	15	6.5	--
Medford	1312	967.2	1015.4	57	32	44.7	-2.5	70	5	23	12	0	20	32	67	.84	-.68	.26	9	0	2.0	1	3.3	S	•30	SSE	18	10	5	16	6.2	--
Pendleton	1489	961.7	1016.4	51	30	40.3	-4.9	69	9	18	29	0	21	24	54	.65	-.53	.28	6	1	2.0	2	8.0	WSW	--	---	--	9	7	15	5.9	--
Portland	22	1010.8	1016.5	54	34	43.9	-2.7	63	22	23	29	0	12	32	67	2.55	-.92	1.17	8	1	T	0	8.3	ESE	35	SW	9	8	6	17	6.4	57
Roseburg	505	997.0	1016.6	56	32	43.8	---	64	°4	24	13	0	19	--	--	2.23	-.70	.60	10	1	T	0	4.8	---	22	S	9	4	11	16	7.0	45
Salem	195	1008.8	1016.3	56	30	42.9	-3.9	64	°22	23	12	0	25	32	69	3.02	-1.17	1.03	7	0	.7	T	7.0	S	--	---	--	9	8	14	6.0	--
Sexton Summit CO	3836	------	------	46	31	38.5	-.8	59	°3	19	11	0	23	--	--	2.62	-.34	.83	13	1	13.4	6	----	---	--	---	--	9	6	16	6.4	--
PENNSYLVANIA																																
Allentown	381	999.0	1013.2	48	29	38.5	+.6	72	29	18	4	0	23	26	63	3.54	+.35	.96	8	1	T	0	14.0	W	--	---	--	10	6	15	6.1	--
Harrisburg	335	1000.0	1013.9	49	31	40.4	-.4	75	29	20	4	0	18	25	56	3.52	+.65	1.11	10	2	.2	T	11.6	W	64	SE	1	10	4	17	6.2	48
Park Place CO	1932	------	------	42	23	32.5	-.3	65	30	10	4	0	29	--	--	4.57	+1.01	2.20	11	0	3.0	2	----	---	--	---	--	5	9	17	6.9	--
Philadelphia CO	26	------	------	51	35	43.0	-.5	72	29	21	5	0	8	--	--	3.78	+.41	1.15	8	1	.4	T	9.3	---	31	SE	1	9	9	13	5.9	66
Philadelphia	13	1008.8	1013.3	52	33	42.3	.0	73	29	23	°6	0	14	26	56	3.71	+.39	1.10	8	1	.3	T	12.8	WNW	•36	WNW	4	10	7	14	5.9	--
Pittsburgh CO	749	------	------	49	30	39.6	-2.0	75	25	16	°6	0	22	--	--	4.32	+.91	1.70	14	--	4.7	--	----	---	--	---	--	--	--	--	---	42
Pittsburgh	1151	983.4	1014.0	46	27	36.8	-1.8	71	13	12	°6	0	23	24	65	4.28	+1.08	1.52	13	3	6.6	5	13.3	WSW	•48	WSW	3	4	8	19	7.6	48
Reading Co	266	1001.0	1013.2	50	33	41.6	.0	73	29	21	5	0	14	--	--	4.84	+1.53	1.68	8	1	T	T	14.5	---	51	S	1	8	9	14	6.2	53
Scranton CO	746	983.1	1012.9	45	28	36.8	-.5	61	29	17	°6	0	21	--	--	2.62	-.13	.96	11	1	.6	T	8.2	---	26	NW	17	8	7	16	6.5	50
Williamsport	527	993.9	1012.9	48	28	37.8	-.5	65	29	17	6	0	22	23	59	4.15	+.81	2.07	10	1	.4	T	10.7	WSW	•58	ESE	1	6	8	17	6.8	--
RHODE ISLAND																																
Block Island	110	1002.4	1006.1	45	32	38.5	+1.4	58	26	23	5	0	18	--	--	2.69	-.85	.95	8	0	.1	T	----	---	--	---	--	9	12	10	5.5	--
Providence	55	1005.4	1011.8	47	29	38.1	+1.3	69	26	19	5	0	23	24	60	3.53	-.05	1.25	9	0	T	T	14.2	WNW	•40	SSE	3	12	8	11	5.4	69
SOUTH CAROLINA																																
Charleston CO	9	1014.6	------	65	49	56.8	-1.3	84	30	33	°7	0	0	--	--	1.96	-1.42	.79	6	2	T	0	10.4	---	33	W	1	9	11	11	5.6	66
Charleston	41	1014.9	1016.6	68	44	56.2	-1.0	88	31	23	7	0	7	43	67	1.38	-2.24	.67	7	1	.0	0	10.6	SSW	--	---	--	8	8	15	6.1	--
Columbia CO	332	1003.1	------	66	45	55.3	-.6	86	25	28	7	0	4	--	--	2.16	-1.28	.48	10	1	T	T	----	---	--	---	--	13	7	11	5.1	--
Columbia	217	1008.1	1016.0	67	42	54.5	-.7	89	25	22	7	0	10	41	66	2.44	-1.35	.54	12	3	.0	0	8.2	SW	--	---	--	7	12	12	5.8	71
Florence	146	1010.5	1015.9	67	42	54.5	-.9	87	25	27	7	0	10	--	--	3.31	-.23	1.15	11	4	.0	0	----	---	--	---	--	9	7	15	6.1	--
Greenville	1018	977.7	1015.3	61	41	50.8	-.7	81	30	25	4	0	10	34	66	7.08	+2.57	1.86	13	4	.0	0	9.8	WSW	33	SW	25	10	9	12	5.7	65
Spartanburg	801	------	------	61	41	51.0	-.7	82	30	24	4	0	10	--	--	6.81	+2.32	1.48	14	2	T	0	----	---	--	---	--	10	10	11	5.6	--
SOUTH DAKOTA																																
Huron	1282	968.8	1017.9	37	18	27.5	-4.2	58	6	-2	4	0	28	20	75	1.96	+.87	1.22	10	0	15.3	10	12.9	S	47	NW	25	7	4	20	7.2	55
Rapid City	3165	899.4	1017.2	39	17	27.7	-3.6	70	10	-5	3	0	29	18	70	2.28	+1.22	1.17	17	0	21.0	15	12.9	NNW	53	NW	24	6	6	19	7.2	46
Sioux Falls	1420	964.1	1017.5	36	19	27.7	-4.3	55	17	0	4	0	28	19	69	2.68	+1.33	1.06	10	1	11.7	8	13.8	NW	•45	ENE	12	5	8	18	6.9	--

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F	°F	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M p.h.		M. p. h.			0–3	4–7	8–10	0–10	%
TENNESSEE																																
Bristol	1519	961.1	------	57	33	45.0	-1.7	85	25	12	2	0	16	--	--	4.82	+1.05	1.49	14	4	7.2	11	----	---	--	---	--	7	7	17	6.6	--
Chattanooga	670	989.2	1017.0	62	38	50.0	-.7	79	25	21	7	0	14	36	65	3.82	-2.23	.97	8	3	T	0	7.1	S	33	NW	31	7	7	17	6.5	59
Knoxville	949	981.0	1016.8	59	37	48.3	-1.1	82	25	21	7	0	13	35	63	4.67	-.16	1.33	11	4	2.7	6	9.1	WSW	45	NW	25	10	7	14	6.2	47
Memphis CO	271	------	------	60	44	51.8	-.6	80	12	25	4	0	5	--	--	1.36	-3.84	.40	8	--	T	T	----	---	--	---	--	--	--	--	---	--
Memphis	263	1001.7	1016.7	61	42	51.7	-.3	81	12	25	4	0	7	36	60	1.99	-3.60	.67	7	3	.0	0	11.2	S	36	W	25	7	9	15	6.6	53
Nashville	577	997.0	1016.9	59	38	48.4	-1.4	77	12	22	4	0	15	36	67	4.22	-1.06	2.66	9	4	.2	T	9.9	S	36	W	2	10	6	15	6.3	45
Oak Ridge CO	905	981.7	------	59	36	47.6	+.1	78	25	18	7	0	16	--	--	6.24	+.55	1.77	10	3	.8	T	5.4	---	30	W	19	8	6	17	6.6	--
TEXAS																																
Abilene	1759	951.6	1014.3	68	42	55.1	.0	91	10	21	14	1	7	27	40	.05	-1.07	.05	16	1	.4	T	14.7	S	49	S	°1	7	8	16	6.4	69
Amarillo	3590	886.2	1013.1	60	31	45.6	-.5	81	28	14	°3	0	18	19	42	.17	-.87	.08	3	0	1.5	1	17.1	W	56	W	18	8	8	15	5.9	63
Austin	615	993.9	1016.0	71	47	59.4	-.9	92	10	30	6	3	3	42	58	.27	-2.27	.16	4	0	T	0	11.3	S	32	N	13	6	12	13	6.5	51
Brownsville	16	1011.9	1014.3	77	59	68.1	.0	99	12	41	7	3	0	58	75	.29	-.85	.23	7	0	.0	0	15.6	SSE	37	SE	24	5	12	14	6.8	62
Corpus Christi	40	1014.2	1015.4	76	56	65.5	+1.2	90	19	37	°1	1	0	54	72	.41	-1.22	.37	4	0	.0	0	15.8	SSE	41	SE	24	4	6	21	7.5	48
Dallas	487	997.3	1016.2	68	45	56.5	-.9	93	10	25	14	2	6	39	56	.59	-2.22	.41	5	2	1.0	1	14.0	SSE	59	W	24	10	8	13	5.9	57
Del Rio	1091	979.7	1014.2	77	50	63.5	+.6	101	°24	28	6	6	1	32	38	T	-.93	T	0	0	.0	0	7.9	ESE	37	NW	24	7	7	17	6.6	61
El Paso	3920	884.2	1012.5	68	42	54.9	+.4	80	29	28	1	0	5	20	27	.09	-.19	.05	2	0	.0	0	14.2	W	56	W	11	9	7	15	6.1	80
Fort Worth	544	995.3	1016.2	67	44	55.9	+.2	93	10	25	6	1	6	34	49	.66	-2.01	.54	4	2	1.7	2	13.7	S	•55	WNW	24	11	6	14	6.3	--
Galveston CO	7	------	------	65	55	59.7	-2.1	80	19	38	14	0	0	--	--	1.69	-1.41	1.06	9	--	.0	0	13.4	---	42	NW	13	--	--	--	---	48
Galveston	5	1014.2	1016.7	66	54	59.9	-1.9	80	19	38	°6	0	0	52	76	1.91	-1.35	1.29	8	0	.0	0	13.6	SSE	--	---	--	6	5	20	7.3	--
Houston CO	41	1011.2	------	71	53	61.9	-.7	85	30	35	14	0	0	--	--	.81	-2.29	.65	7	0	.0	0	11.5	---	35	N	13	7	9	15	6.4	50
Houston	50	1013.5	1016.6	71	51	60.9	-.7	85	°12	34	°7	0	0	46	65	.89	-1.89	.61	7	0	.0	0	14.4	SSE	--	---	--	5	6	20	7.5	--
Laredo	500	999.0	1013.8	81	56	68.5	+.1	104	30	39	15	10	0	47	53	.23	-.67	.22	2	0	.0	0	13.7	SE	•30	NNW	13	9	4	18	6.5	--
Lubbock	3243	900.8	1013.2	64	33	48.6	-1.1	84	10	13	14	0	14	22	39	.04	-.76	.04	1	0	T	T	16.0	WSW	•45	SW	°11	7	11	13	6.0	--
Midland	2854	914.3	1013.4	69	41	55.1	---	88	10	24	14	0	8	20	31	.04	----	.04	1	0	T	T	9.0	SW	•33	N	°2	6	10	15	6.6	--
Port Authur	16	1015.2	1016.8	69	49	59.1	-1.2	84	19	34	°4	0	0	50	76	1.29	-2.71	.66	7	1	.0	0	14.0	S	40	SE	°2	4	9	18	7.0	41
San Angelo	1903	947.2	1014.6	70	44	56.9	-1.3	90	°10	28	6	2	6	30	40	.34	-.61	.34	1	0	.1	T	----	---	--	---	--	7	11	13	6.4	--
San Antonio	792	989.8	1015.1	75	50	62.3	+.9	95	10	30	1	5	2	38	49	.03	-2.09	.02	2	0	T	T	9.2	NNE	47	NE	13	8	5	18	6.8	60
Victoria	110	1010.8	1015.5	74	53	63.4	-.5	91	12	36	7	1	0	47	60	.46	-2.18	.45	3	0	.0	0	14.7	---	%50	SSE	24	5	8	18	6.9	--
Waco	500	997.0	1015.7	69	45	57.1	-1.3	94	10	28	14	1	5	40	57	.86	-2.08	.47	6	4	T	T	11.9	S	--	---	--	6	11	14	6.5	--
Wichita Falls	1027	978.0	1015.0	64	40	52.0	-1.0	89	28	21	°3	0	9	28	45	.45	-1.16	.42	3	1	T	T	11.1	N	•40	W	24	11	7	13	5.6	--
UTAH																																
Milford	5028	843.2	1014.5	51	23	36.7	-2.5	67	°8	6	3	0	27	--	--	1.31	+.25	.34	10	0	7.7	2	----	---	--	---	--	13	4	14	5.4	--
Salt Lake City	4222	864.2	1014.0	48	29	38.5	-2.6	66	10	13	13	0	22	26	62	1.50	-.16	.53	11	2	10.7	4	10.5	SE	71	NW	10	10	3	18	6.5	54
VERMONT																																
Burlington	331	995.9	1011.0	38	21	29.7	+.4	59	1	2	31	0	27	19	66	2.41	+.22	.85	13	0	15.3	8	11.4	S	35	S	1	7	3	21	7.2	51
VIRGINIA																																
Lynchburg	947	980.7	1014.9	56	35	45.4	-1.0	78	30	21	5	0	13	28	56	3.14	-.43	1.33	9	1	T	T	10.1	WNW	37	SE	1	7	13	11	5.9	62
Norfolk	26	1013.9	1015.1	58	39	48.7	-.4	84	25	26	5	0	6	35	63	4.14	+.87	1.85	10	3	.0	0	11.6	WNW	38	W	1	8	9	14	5.9	59
Richmond	162	1008.8	1015.1	59	35	47.0	-.5	82	25	20	5	0	11	31	59	2.44	-.98	.98	10	0	.0	0	9.5	W	35	SE	1	7	12	12	5.6	65
Roanoke	1174	972.2	1015.1	56	36	45.5	-.8	78	25	22	°5	0	14	28	55	2.76	-.43	.68	10	1	T	0	12.5	WNW	--	---	--	5	16	10	6.0	--
WASHINGTON																																
Olympia	190	1009.1	1016.5	53	29	40.6	-3.1	61	°4	20	29	0	24	29	67	3.13	-1.37	1.31	12	0	T	0	6.6	SSW	•25	SW	15	10	8	13	6.1	--
Seattle CO	14	------	------	52	37	44.6	-2.4	61	19	31	12	0	3	--	--	2.08	-.98	1.06	10	0	T	0	9.9	---	45	SW	9	9	9	13	5.8	52
Seattle	14	1015.6	1016.7	--	--	----	---	--	--	--	--	--	--	32	66	----	----	----	--	--	----	--	7.3	SSE	--	---	--	--	--	--	---	--
Seattle-Tacoma	379	1002.4	1016.8	50	31	40.7	-3.8	59	19	24	29	0	20	30	69	2.07	-1.33	.96	12	1	3.3	2	11.2	SW	--	---	--	8	9	14	6.3	--
Spokane	2357	946.2	1016.2	46	27	36.3	-1.8	60	9	15	28	0	24	22	57	.83	-.51	.55	5	0	.1	T	7.7	NE	36	SW	9	8	7	16	6.4	67
Tatoosh CO	101	1013.2	1016.5	48	38	42.8	-1.9	54	19	32	28	0	1	33	72	3.71	-4.11	1.60	12	0	T	T	15.4	E	49	SW	9	6	8	17	6.8	52
Walla Walla CO	949	980.0	1016.5	52	34	42.7	-4.1	68	9	22	29	0	12	--	--	1.30	-.22	.57	7	0	3.9	3	5.9	---	31	W	27	10	9	[illegible]	5.5	61
Walla Walla	1200	------	------	--	--	----	---	--	--	--	--	--	--	·28	--	----	----	----	--	--	----	--	7.8	S	--	---	--	--	--	--	---	--
Yakima	1061	977.0	1016.8	53	26	39.4	-4.3	62	9	14	29	0	25	22	54	.51	+.05	.32	3	0	T	0	8.1	W	--	---	--	8	8	14	6.2	--
WEST VIRGINIA																																
Charleston	950	979.7	1015.3	54	33	43.6	-1.3	87	25	18	5	0	17	30	64	3.25	-.91	.47	13	4	10.5	10	10.9	WSW	•38	SSW	25	5	8	18	7.1	--
Elkins	1970	944.5	1015.2	50	26	37.8	-1.5	84	25	13	°4	0	26	27	--	4.08	+.29	1.29	15	3	9.4	5	7.8	WNW	38	W	4	6	6	19	7.3	[illegible]
Huntington	565	------	------	56	33	44.3	-2.9	86	25	19	5	0	16	--	--	3.22	-.86	1.47	11	--	9.0	7	----	---	--	---	--	--	--	--	---	--
Parkersburg CO	615	------	------	52	31	41.5	-2.1	84	25	18	°4	0	20	--	--	3.58	+.04	1.77	12	3	7.8	7	7.7	---	27	W	3	6	8	17	7.1	49
Parkersburg	837	------	1014.9	--	--	----	---	--	--	--	--	--	--	29	--	----	----	----	--	--	----	--	10.7	WSW	--	---	--	--	--	--	---	-
Petersburg	1013	------	------	53	30	41.7	-2.1	77	29	20	4	0	19	--	--	3.38	+.78	1.80	11	3	2.5	1	----	---	--	---	--	10	9	12	[illegible]	--
WISCONSIN																																
Green Bay	689	992.2	1015.7	37	21	28.9	+.4	63	25	7	5	0	29	18	65	1.11	-.65	.42	9	0	5.4	4	10.2	NW	60	SW	25	12	6	13	5.5	59
La Crosse	652	990.9	1016.6	39	21	30.2	-1.4	57	18	6	°4	0	29	18	64	1.41	-.45	.45	10	2	6.9	4	10.9	NW	•32	WNW	25	10	6	15	6.1	--
Madison	857	979.0	1015.9	41	22	31.5	-1.0	62	25	7	5	0	29	19	63	1.19	-.64	.47	11	1	3.6	2	12.9	N	70	SW	25	9	9	13	5.9	68
Milwaukee	675	989.8	1015.6	39	25	31.6	-1.7	66	25	10	4	0	28	20	63	1.65	-.54	.90	9	2	3.3	2	13.8	WNW	73	SW	25	9	8	14	6.3	60
WYOMING																																
Casper	5322	832.7	1014.5	38	15	26.2	-6.2	58	10	-11	2	0	29	18	71	2.43	+1.30	.95	14	0	32.9	12	13.4	SW	--	---	--	3	10	18	7.5	--
Cheyenne	6139	806.0	1014.7	40	16	27.7	-4.1	62	10	-12	31	0	29	15	64	2.54	+1.32	1.19	8	0	22.6	11	15.4	WSW	61	W	27	6	8	17	6.9	45
Lander	5563	831.4	1016.0	38	15	26.7	-4.6	60	10	-13	3	0	30	17	71	1.85	+.71	.49	12	0	32.7	7	6.3	---	43	SW	10	6	8	17	7.0	60
Rock Springs	6741	788.7	1015.1	39	17	28.2	-1.0	53	9	-2	3	0	30	16	--	1.13	+.47	.36	10	1	10.8	3	15.4	WSW	•50	W	27	5	6	20	7.3	--
Sheridan	3942	882.2	1017.9	39	15	26.7	-4.9	67	10	-6	3	0	30	18	73	3.04	+1.67	.92	16	0	36.8	7	8.8	NW	49	NW	11	5	7	19	7.4	56
PACIFIC AREA																																
Canton Island	9	1008.5	1009.0	90	78	83.7	+.6	95	13	76	23	15	0	74	76	.09	-1.83	.05	4	0	.0	0	----	--	--	---	--	10	15	6	5.1	--
Hilo	28	1012.5	1014.4	78	62	69.8	-1.0	83	°22	56	13	0	0	63	81	13.37	-2.35	6.86	21	2	.0	0	3.2	N	•38	N	6	5	8	18	7.3	46
Honolulu	7	1015.2	1015.9	78	65	71.5	-1.5	84	28	57	24	0	0	61	72	2.54	+.24	1.06	14	1	.0	0	10.4	NE	33	N	°5	8	14	9	6.1	65
Koror CO	94	1006.4	1010.2	88	75	81.7	+.8	91	15	73	°7	6	0	--	--	9.74	+2.06	5.07	21	0	.0	0	4.2	---	33	---	1	1	12	18	7.5	--
Lihue	115	1010.5	1015.8	77	62	69.5	-1.1	81	28	55	23	0	0	61	75	4.88	+.81	.36	15	0	.0	0	10.4	NE	36	N	5	6	14	11	6.0	39
Truk (Moen Island)	3	1010.2	1010.4	85	77	81.2	-.1	87	°6	74	°2	0	0	--	--	6.26	-.37	2.33	16	0	.0	0	----	---	--	---	--	0	3	28	9.2	--
Wake Island	11	1014.9	1015.6	81	73	77.0	-.9	84	°26	70	°1	0	0	67	71	1.15	-.25	.13	15	0	.0	0	15.4	ENE	--	---	--	11	15	5	4.4	--
Yap CO	51	1008.8	1010.7	87	76	81.6	+.1	90	°29	72	6	2	0	75	81	2.37	-2.34	1.06	13	0	.0	0	----	---	--	---	--	0	8	23	8.7	--
WEST INDIES																																
San Juan CO	47	------	------	82	70	76.1	+.5	89	10	68	15	0	0	--	--	1.16	-1.26	.29	12	0	.0	0	----	---	--	---	--	--	--	--	---	--
San Juan, P. R.	9	1014.2	1016.1	83	70	76.9	+1.2	90	16	68	15	1	0	68	76	1.15	-1.63	.54	13	0	.0	0	10.6	ENE	[illegible]	E	[illegible]	14	11	6	[illegible]	77

Data from airport unless otherwise specified. CO indicates data from city office.
• Data entered in column "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.
° Other dates also.
% Peak gust.

HEATING DEGREE DAYS

(Base 65°F.)

Table 3

MARCH 1954

State and station	Current season		Normals July through this month
	This month	Period July through this month	
ALABAMA			
Birmingham	383	2488	2622
Mobile	250	1533	1565
Montgomery (CO)	292	1835	1888
Montgomery	307	1996	2057
ARIZONA			
Flagstaff	1008	5845	6161
Phoenix (CO)	160	1108	1430
Phoenix	206	1354	1624
Prescott	679	3682	3984
Tucson	179	1339	1692
Winslow	645	4100	4215
Yuma	87	743	937
ARKANSAS			
Ft. Smith	476	3026	3037
Little Rock	395	2681	2842
Texarkana	337	2256	2278
CALIFORNIA			
Bakersfield	296	2034	1989
Bishop	651	3642	3725
Blue Canyon	893	4234	4523
Burbank	298	1234	1549
Eureka (CO)	545	3404	3543
Fresno	401	2389	2344
Los Angeles (CO)	242	935	1235
Los Angeles	279	1246	1653
Mt Shasta (CO)	799	4479	4833
Oakland	422	2331	2550
Red Bluff	424	2278	2318
Sacramento (CO)	404	2234	2314
Sacramento	433	2447	2490
Sandberg (CO)	717	3424	3491
San Diego	234	987	1283
San Francisco (CO)	396	2257	2362
San Francisco	469	2517	2666
San Jose	407	1947	1998
Santa Maria	406	2135	2277
COLORADO			
Alamosa	1023	6898	7317
Colorado Springs	951	4808	5317
Denver	912	4443	5256
Grand Junction	766	4585	5226
Pueblo	818	4250	5023
CONNECTICUT			
Bridgeport	771	4359	5048
Hartford	802	4752	5379
New Haven	821	4645	5146
DELAWARE			
Wilmington	723	4114	4398
DIST. OF COLUMBIA			
Washington (CO)	621	3454	3864
Washington	627	3525	3923
FLORIDA			
Apalachicola (CO)	204	1158	1274
Daytona Beach	188	727	857
Fort Myers	99	360	405
Jacksonville (CO)	180	980	1099
Jacksonville	207	1104	1220
Key West (CO)	10	39	77
Miami (CO)	48	163	173
Int. Airport, Hialeah	40	144	178
Miami Beach	23	80	123
Orlando	147	612	650
Pensacola (CO)	230	1330	1390
Tallahassee	226	1369	1481
Tampa	141	530	674
West Palm Beach	53	220	248
GEORGIA			
Albany	246	1596	1723
Athens	392	2546	2657
Atlanta (CO)	398	2513	2652
Atlanta	387	2520	2673
Augusta	337	2235	2076
Columbus	327	2144	2299
Macon	291	1948	1987
Rome	470	2973	2952
Savannah	272	1664	1667
Valdosta	239	1396	1487
IDAHO			
Boise	791	4482	5096
Lewiston	768	4293	4785
Pocatello	954	5217	5962
ILLINOIS			
Cairo (CO)	531	3291	3527
Chicago (CO)	914	4587	
Chicago	922	4736	5516
Chicago University	919	4651	
Moline	953	5133	5667
Peoria	910	4827	5419
Springfield (CO)	791	4186	4734
Springfield	836	4507	5086
INDIANA			
Evansville	655	3871	4013
Ft. Wayne	925	4898	5492
Indianapolis (CO)	802	4219	4603
Indianapolis	842	4501	4973
South Bend	976	5127	5683
INDIANA (Cont'd.)			
Terre Haute	808	4422	4826
IOWA			
Burlington	903	4906	5463
Des Moines	980	5216	5762
Dubuque	1054	5756	6385
Sioux City	1047	5575	6256
KANSAS			
Concordia (CO)	811	4316	4816
Dodge City	761	4104	4561
Goodland	953	4953	5534
Topeka (CO)	735	4029	4499
Topeka	739	4172	4731
Wichita	687	3861	4183
KENTUCKY			
Lexington	680	3867	4456
Louisville (CO)	655	3513	3923
Louisville	651	3748	4055
Pikeville (CO)	590	3385	
LOUISIANA			
Baton Rouge	224	1452	1547
Lake Charles	226	1328	1503
New Orleans (CO)	190	1071	1156
New Orleans	182	1153	
Int.Airport, Moisant	211	1292	1286
Shreveport	293	1982	2056
MAINE			
Caribou	1314	7702	8551
Greenville (CO)	1232	7152	
Portland	1026	5942	6477
MARYLAND			
Baltimore (CO)	601	3339	3804
Baltimore	706	4004	4154
Frederick	756	4440	4380
MASSACHUSETTS			
Boston	806	4477	4979
Milton	926	5009	
Nantucket	849	4374	4927
Pittsfield	1024	6030	6563
MICHIGAN			
Alpena (CO)	1180	6116	6739
Detroit	967	4986	5535
Escanaba (CO)	1203	6390	7216
Grand Rapids (CO)	995	5076	5622
Grand Rapids	1046	5412	6089
Lansing	1056	5531	6034
Marquette (CO)	1191	6346	7074
Muskegon	1041	5379	5981
Sault Ste. Marie	1335	7157	7906
Ypsilanti	970	5108	
MINNESOTA			
Duluth (CO)	1310	7586	8086
Duluth	1385	7776	8439
International Falls	1488	8572	9158
Minneapolis	1145	6276	6944
Rochester	1140	6415	7105
St. Cloud	1258	7221	7793
MISSISSIPPI			
Jackson	311	2048	2121
Meridian	324	2189	2239
Vicksburg (CO)	286	1873	1929
MISSOURI			
Columbia	732	4062	4638
Kansas City	717	3935	4477
St. Joseph	793	4443	4869
St. Louis (CO)	670	3609	4098
St. Louis	703	3829	4290
Springfield	672	3822	4264
MONTANA			
Billings	1162	5383	6119
Glasgow (CO)	1296	6739	7668
Great Falls	1204	5724	6409
Havre (CO)	1269	6388	7178
Helena	1160	6037	7000
Kalispell	1089	6308	6810
Miles City	1182	5990	6861
Missoula	1007	5870	6723
NEBRASKA			
Grand Island	952	5134	5654
Lincoln (CO)	901	4785	5284
Lincoln	924	4903	5475
Norfolk	1072	5626	6253
North Platte	1007	5353	5755
Omaha	920	4868	5564
Scottsbluff	1069	5144	5888
Valentine (CO)	1127	5367	6161
NEVADA			
Elko	984	5837	6162
Ely	1024	5909	6186
Las Vegas	393	2334	2333
Reno	854	4731	5034
Tonopah	833	4524	4946
Winnemucca	910	5065	5413
NEW HAMPSHIRE			
Concord	994	5840	6554
Mt. Washington	1739	10573	
NEW JERSEY			
Atlantic City (CO)	706	3637	4060
Newark	728	4083	4643
Trenton (CO)	719	4010	4495
NEW MEXICO			
Albuquerque	581	3630	4030
Clayton	759	4128	4510
Roswell	418	3066	3211
NEW YORK			
Albany	941	5541	6069
Binghamton	1090	5836	6459
Buffalo	988	5201	5815
New York (CO)	729	3864	4423
La Guardia Field	704	3759	4391
Rochester	1013	5365	5905
Schenectady	918	5235	
Syracuse	975	5325	5666
NORTH CAROLINA			
Asheville (CO)	596	3544	3677
Asheville	605	3927	
Charlotte	471	2785	3004
Greensboro	541	3304	3519
Hatteras (CO)	361	2007	2196
Raleigh (CO)	478	2748	2874
Raleigh	498	2952	3126
Wilmington	356	2104	2212
Winston-Salem	519	3091	3440
NORTH DAKOTA			
Bismarck	1268	6902	7905
Devils Lake (CO)	1311	7746	8659
Fargo	1219	7421	8148
Grand Forks	1274	7783	
Pembina	1309	7863	
Williston (CO)	1309	6946	7907
OHIO			
Akron	969	5132	5381
Cincinnati (CO)	691	3682	4110
Cincinnati	777	4176	4631
Cleveland (CO)	887	4448	4935
Cleveland	920	4728	5206
Columbus	836	4499	4960
Dayton	850	4498	4944
Sandusky (CO)	884	4546	5088
Toledo	950	4971	5534
Youngstown	964	5177	5344
OKLAHOMA			
Oklahoma City (CO)	524	3075	3312
Oklahoma City	540	3122	3422
Tulsa	520	3062	3367
OREGON			
Astoria	684	3802	
Burns (CO)	912	5237	5858
Eugene	684	3726	3961
Meacham	1045	5692	6317
Medford	621	3728	3890
Pendleton	758	4185	4570
Portland (CO)	594	3271	3527
Portland	649	3695	3901
Roseburg	652	3460	
Salem	678	3777	3826
Sexton Summit (CO)	816	4717	4876
PENNSYLVANIA			
Allentown	817	4761	5196
Harrisburg	758	4321	4693
Park Place (CO)	1001	5657	6152
Philadelphia (CO)	671	3608	4061
Philadelphia	696	3923	4360
Pittsburgh (CO)	782	4094	4496
Pittsburgh	869	4713	5188
Reading (CO)	722	4065	4515
Scranton (CO)	865	4847	5300
Williamsport	838	4910	5215
RHODE ISLAND			
Block Island	817	4196	4809
Providence	828	4720	5239
SOUTH CAROLINA			
Charleston (CO)	279	1557	1726
Charleston	311	1850	1910
Columbia (CO)	329	2019	2207
Columbia	352	2263	2352
Florence	342	2126	2424
Greenville	439	2656	2867
Spartanburg	437	2711	2866
SOUTH DAKOTA			
Huron	1156	6417	6985
Pierre	1165	5876	
Rapid City	1150	5364	6415
Sioux Falls	1150	6381	6934
TENNESSEE			
Bristol	616	3679	3779
Chattanooga	464	3012	3160
Knoxville	511	3197	3344
Memphis	423	2766	2974
TENNESSEE (Cont'd.)			
Nashville	512	3193	3284
TEXAS			
Abilene	343	2251	2544
Amarillo	594	3396	3948
Austin	240	1573	1663
Brownsville	92	486	617
Corpus Christi	124	753	1005
Dallas	315	2085	2197
Del Rio	176	1383	1386
El Paso	316	2404	2531
Ft. Worth	324	2167	2266
Galveston (CO)	186	1005	1181
Galveston	185	1050	1205
Houston (CO)	187	1098	1249
Houston	206	1218	1352
Laredo	118	788	781
Lubbock	504	3112	3350
Midland	339	2258	
Port Arthur	227	1359	1478
San Angelo	296	2069	2045
San Antonio	194	1362	1545
Victoria	168	1035	1112
Waco	294	1905	1959
Wichita Falls	415	2479	2869
UTAH			
Milford	872	5235	5583
Salt Lake City (CO)	767	4231	4777
Salt Lake City	813	4572	5099
VERMONT			
Burlington	1088	6201	6805
VIRGINIA			
Lynchburg	601	3533	3777
Norfolk	499	2821	3130
Richmond	553	3297	3618
Roanoke	597	3535	3782
WASHINGTON			
Olympia	748	4390	4482
Seattle (CO)	626	3481	3689
Seattle	745	4199	4336
Spokane	882	5267	5815
Tatoosh Island (CO)	684	4203	4432
Walla Walla (CO)	686	3805	4301
Yakima	789	4891	5179
WEST VIRGINIA			
Charleston	665	3744	3989
Elkins	837	5003	5019
Huntington (CO)	642	3618	3732
Parkersburg (CO)	729	3985	4271
Petersburg (CO)	717	4160	4435
WISCONSIN			
Green Bay	1110	6272	7109
La Crosse	1071	5849	6774
Madison (CO)	1059	5644	6382
Madison	1034	5673	6484
Milwaukee (CO)	992	5186	5903
Milwaukee	1028	5433	6124
WYOMING			
Casper	1197	5718	6451
Cheyenne	1148	5450	6210
Lander	1180	5811	7057
Rock Springs (CO)	1069	5818	
Rock Springs	1135	6103	7102
Sheridan	1182	5742	6710

Data from airport unless otherwise specified. CO indicates data from city office.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4

MARCH 1954

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Kentucky, eastern portion	Feb. 28-Mar. 1					7	$243,600	$3,000	Snow	Greatest damage to utilities and communication facilities. In many areas lines out for several days. Also heavy damage to trees, shrubs, and orchards. Weight of snow caused roof of building to collapse. Schools in many areas forced to close. Reports of as much as 18 inches of snow. Some telephone companies indicated damage most extensive in history of their management. Injuries caused indirectly by storm.
West Virginia and Virginia	Feb. 28-Mar. 1								Snow and rain	Extensive damage to utility lines in southern portions of both States. Minor flooding in some areas. In Huntington, W. Va., area, worst damage to utility lines in 30 years.
Dolphin, Brunswick County, Va.	1	5:10 a.m.			0	0	Minor		Tornado	Destroyed numerous sheds and outbuildings; blew down utility lines and TV antennas.
Harnett, Beaufort, Wilson, Nash, Edgecombe, Wayne, Greene, Lenoir, and Cumberland Counties, N. C.	1	Predawn					25,000		Wind	Trees uprooted, roofs damaged, power and telephone lines broken, outbuildings blown over. Heaviest damage to school at Erwin, Harnett County; roof removed. Newspaper report of tornado in Rock Ridge community, Wilson County, but reports of damage fail to establish character of storm; damage slight.
Pennsylvania, entire State	1	All day			1	1			Wind and rain	Gusty winds of gale force or stronger reported as most severe wind since 1950 in some areas and since 1947 in other areas. Over $5,000 loss in each of following areas: Ellwood City, Johnstown, Bellefonte, Lock Haven, Sunbury, Gratz, Hazleton, Pottsville, Wilkes-Barre, and Columbia. Wind damage included at least 13 airplanes, at least 30 large structures, and scores of smaller ones unroofed and/or demolished; tree and wire damage very general. High winds caused at least 4 fires by forced draft in chimneys, and 1 barn fire by short circuiting wires in Lancaster County. Heavy rains of 2 inches or more in 12 to 24 hours set off rock slides in Ellwood City, Altoona, Bellefonte, Renovo, and Mauch Chunk areas. Some blocked highways for several days. At Ellwood City, slide demolished home, killed sleeping girl in her bed.
New York, entire State	1						See remarks		Wind and snow	Winds of gale force which reached speeds of 65 m. p. h. in some sections of western New York, covered entire State and brought heavy snow to extreme western counties, impeding traffic. Windstorm damage not heavy in any locality, but aggregate for State amounted to thousands of dollars.
Berkshire County, Mass., and Bennington and Rutland Counties, Vt.	1	Evening					7,500		Wind	Southwest gales with gusts up to 60 m.p.h. struck Berkshires and southwestern Vermont with maximum intensity and damage over latter area. Property damage resulted from large branches falling across wires knocking them down or short-circuiting them; television aerials bent or blown down; plate-glass windows blown in, etc. Storm lasted about 6 hours.
Ohio, northern counties	1-4		*60		7	10			Snow and wind	Heavy snowfall drifted by winds of over 50 m.p.h. left most of northern Ohio paralyzed for several days under drifts of 5 to 8 feet. Hardest hit were Cleveland and northeastern cities. Over 2,000 cars marooned in Cleveland, plus numerous cars, trucks, and buses on main routes. Power lines, trees, canopies, etc. downed by winds and snow weight. Most northern highways and schools closed for nearly a week. Damage estimated at many thousands of dollars.
Lake Seminoe, Wyo.	2	P.m.	10	**20			1,000		Wind	Disturbance in nature of local gust; damage limited to 2 trailer houses.
Pennsylvania, entire State	3	All day				6			Wind, rain, and snow	Nearly a duplicate of storm of March 1, except major damage confined to western half of State, although much minor damage in eastern half. Erie, Beaver, Allegheny, Armstrong, Indiana, Clearfield, and Bedford Counties reported most major damage from winds and heavy rains (more than 3 inches in 12 hours in Everett area). Near Everett, temporary bridge washed out, and a rock slide occurred. In upper Juniata basin, highways flooded in at least 50 places as Juniata River rose 7 feet in 16 hours. Tree and wire damage extensive; roofs and buildings damaged by wind. In afternoon, 4 inches of wet snow clogged highways in Hazleton-Wilkes-Barre area.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

MARCH 1954

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Pennsylvania, northwestern counties	3-4					3			Wind and snow	Gale-force northwest winds brought 6 to 12 inches of snow, caused heavy drifting, and produced blizzard conditions as far southeast as Franklin, Kane, and Bradford. 3 persons injured in Oil City area. 6 persons marooned on Presque Isle peninsula, when wind-whipped waves damaged 700 feet of Isle Parkway, and coated area with ice from Lake Erie and glaze. Ice in spots 8 feet thick along roadway.
Ohio, scattered areas	3	All day							Wind	Winds of 60 to 70 m.p.h. caused considerable damage in Zanesville, Springfield, Warren, Mansfield, Coshocton, and Dover. Winds collapsed buildings, tore large signs down, blew TV tower over, broke large glass windows, downed trees and utility lines, and toppled chimneys and TV aerials. Damage estimated at many thousands of dollars.
Southern New England and Vermont	3	Evening			1		$10,000		Wind and rain	Southeast gales over wide area caused considerable damage to trees, antennas, and windows. Many wires and power lines downed by falling large branches or trees, causing most of loss. Woman killed in North Attleboro, Mass., in automobile accident as result of poor visibility due to wind-driven rain.
Niagara and Erie Counties, N. Y.	3						See remarks		Wind	Wind with speeds to 50 m.p.h. lashed Lake Erie waters over breakwaters, causing estimated flood loss of $25,000 in Woodlawn section. Niagara River rose menacingly, but no reports of resultant serious damage.
Danville, Ill.	4	2 a.m.					5,000		do	2 large smokestacks, many trees, and television antennas blown down.
Tucson, Ariz.	4	11:15 a.m.			0	0	0	$0	Tornado	Well-developed vortex appeared at base of dark clouds, with funnel reaching ground at about 11:20 a.m. Funnel well defined. Dust had been carried about 3/4 of distance to cloud base when dissipation began shortly after 11:30 a.m. Elevation of cloud base estimated at 5,000 feet above ground.
Woodbury, N. J.	4	Late a.m.							Wind	Damage to power lines caused 125 homes to be without power for about 2 hours.
Freehold, Ocean Grove, and Colts Neck, N. J.	4	P.m.							do	Minor damage to urban area power lines. House and street lights inoperative for ½ to 1 hour.
Hawaiian Islands	5 to 7				1		47,000		Wind and high seas	Strong winds caused $12,000 damage in Honolulu, and caused heavy seas that tore out portions of breakwater walls at Kahalui (Maui) and Hilo (Hawaii). At Hilo fisherman lost his life when small boat broke up against breakwater. Most damage by seas washing heavy boulders onto roads and private properties. Damage at Hilo $35,000.
Florida, northern portion	6	A.m.							Snow	Accumulated depths:- Milton 4 inches; Niceville 3 inches; Pensacola 2 inches; Caryville 1 inch. Southern and eastern limits of reports of snow or sleet were Panama City, Live Oak, and Jacksonville.
Bonners Ferry, Idaho	9	Shortly before midnight			2				Rain and wind	Heavy rains evidently a factor in causing landslide which struck grocery store and locker plant, killing 2 persons. Very strong wind night of slide, but no other damage reported.
Bellefonte (near), Pa.	10	6 a.m.							Wind	Winds unroofed 6 of 7 cabins along highway. Damage estimated at several hundred dollars.
Foxboro, Mass.	10	3 p.m.	3	**65					Dust devil	No clouds present at time of occurrence. Eyewitness observed dark, swirling, cloudlike mass sweep across 200-foot wide dump, strewing debris and objects for distance of about one-quarter mile.
Rye, Colo.	10	Night					1,000		Wind	Damage limited to farm buildings.
Colorado, eastern portion	10-12		*200	300		6	50,000	2,000,000	Wind, snow, and dust	Strong winds, reaching gale force in many sections, accompanied by moderate snow in north and drifting soil in southwest. Dust clouds reduced visibility. Snow drifts closed roads, marooned motorists, and damaged transmission lines. Wind uprooted trees, damaged small buildings, and eroded soils.
Roswell, N. M.	11						2,500		Wind	Abnormally high winds over entire State. Light damage to plate-glass windows, TV antennas, and signs in many areas. Undetermined damage to winter grains and ranges.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Kansas, entire State	11-12	Noon of 11th through 12th			2	Numerous			Wind, snow, and dust	Intense low pressure moved eastward across northern Kansas; winds averaged 35 to 45 m.p.h. and locally higher. Blowing snow in northwest, blowing dust in southwest, and much dust in air entire State. Visibility near zero halted traffic in west and locally in east. Many instances of minor damage to buildings. Deaths from traffic accident in blinding dust.
Osborne (1½ miles northeast of), Osborne County, Kans.	11	5:55 p.m.			0	0	$1,000	$0	Tornado	Buildings on 1 farm damaged, debris widely scattered, and trees uprooted by funnel-shaped cloud moving northeastward.
South Dakota, entire State	11-12					8	100,000		Snow and winds	Storm left 15 inches new snow at Rapid City, 20 to 30 inches in northern Black Hills, and 10 inches in northwest. Snowfall depth in general 1 to 2 inches remainder of northern counties to 5 to 10 inches in central and southern tier counties. Precipitation type varied from rain and icing conditions to sleet to snow and snow pellets; however, strong winds 40 to 50 m.p.h. caused drifting and roads were blocked. Road and air transportation near standstill for 24 hours. Power and telephone lines and poles damaged across central and southern part of State, also in northern Black Hills region. Temperatures during storm in 20's.
Bridgeport, Nebr.	11								Blizzard and snow	Blizzard and snow drifts prevented firemen from reaching potato cellar fire; loss, $175,000.
Dade and St. Clair Counties, Mo.	12	All day				2	1,000		Wind and dust	Extensive damage to roofs, TV antennas, and loose equipment.
Wyoming, eastern and extreme northern portions	12	Most of day							Blizzard	Blizzard conditions prevailed, drifting newly fallen snow. Livestock suffered and a few losses reported. Roads blocked in many sections and automobile traffic halted for limited periods.
Nebraska, northeastern portion	12-13	Day and night					150,000		Ice (glaze)	Widespread damage to wires, trees, and television antennas.
Iowa, west-central portion	12					Several	1,000,000		Sleet and ice (glaze)	Damage most severe in 10-county area from Buena Vista to Story. North-south telephone lines and power lines especially hard hit. Estimated that 153 towns isolated, 1,500 toll lines out, and 5,000 rural telephones out. Assistance called in from neighboring States, with 2,000 repairmen working on down lines. Ice accumulation 1 inch on ground, and 2 inches or more diameter on wires.
Horton (6 miles southeast of), Atchison County, Kans.	12	12:20 p.m.			0	0	1,200	0	Tornado	Tornado cloud, observed by several persons, damaged barns, blew windows out of house, and uprooted fruit trees on 1 farm.
Griggsville area, Ill.	12	Afterooon					5,000		Hail	Roofs damaged and many windows broken; unusually large hailstones.
Sangamon, Menard, and Logan Counties, Ill.	12	6 p.m.		40	0	3	250,000	0	Tornado, wind, and hail	Damage occurred in rural areas and in city of Lincoln. Storm moved northeastward from vicinity of Pleasant Plains in Sangamon County. Hail reported in several localities.
Moline-Rock Island area, Ill.	12	6 p.m.					500		Hail	Greenhouses damaged.
Forester, Mich.	12	P.m.					50,000		Electrical	Lightning and resulting fire destroyed church.
Lowell, Mich.	12-13	Night							Hail and Wind	Hail, size of golf balls, and wind smashed several hundred windows in about half of homes and business places.
Wisconsin, northern portion	12-13	Night							Snow and winds	Up to 12 inches of snow fell in northern sections, especially in north-central between Wausau and Rhinelander. High winds caused much drifting, blocking secondary roads.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Wisconsin, southern portion	12-13	Night					$50,000		Electrical, sleet, hail and wind	Very heavy sleet, plus some hail, fell in Milwaukee and some other southern counties. Stones measured up to 1 inch in diameter and covered ground to depth of 2 to 3 inches. Gusty winds up to 50 m.p.h. prevailed at time of sleetstorm. Electrical service disrupted; many tree branches broken and several plate-glass windows shattered. Lightning and fire destroyed church in Milwaukee County. Considerable dust from Southwest observed in air on 12th.
Pimento (1½ miles southwest of), Vigo County, Ind.	12	11 p.m.			0	0	100	$0	Tornado	Chicken house demolished; doors torn from nearby barn. At least 2 persons heard roar of approaching tornado. Storm moved north-northeastward.
London, Laurel County, Ky.	13	A.m.					2,000		Wind	Lifted roof of garage and wrecked barn.
New England, central and northern portions	13-15	Afternoon 13th-midday, 15th			3	55			Ice (glaze), sleet, and snow	Deaths and injuries result of series of 150 highway accidents as northeast storm brought freezing rain, sleet, and snow. Driving conditions on 14th described as "most treacherous and hazardous."
Chatom, Ala.	13	4 p.m.					30,000		Hail	Hail covered about a 3-mile radius with Chatom as center; 216 window panes broken in Chatom school buildings and 1 building had to be reroofed. Some hailstones reported as large as baseballs.
LaGrange, Ga.	13	7:30-9:30 p.m.					1,000		Wind and electrical	Many trees broken or blown in scattered sections of LaGrange with extensive damages to utility lines and equipment from wind and lightning.
Crenshaw County, Ala.	13	P.m.					2,000		Wind	1 small house destroyed.
Ft. Mitchell, Ala.	13	8:40 p.m.	880	1	0	0	15,250		Tornado	Tornado believed to have been same storm which struck Ft. Benning, Ga., later that night.
Phenix City, Ala.	13	9 p.m.				1	30,000		Wind	Winds, accompanying thunderstorm, estimated at 40 m.p.h. with gusts somewhat higher. Red Cross reported 5 homes destroyed and 15 damaged; 5 other buildings destroyed and 7 damaged.
Fort Benning, Ga.	13	9:40-9:45 p.m.	100-600	10	2	20	6,000,000	0	Tornado	Originated near Fort Mitchell, Ala., moving east-northeastward over 4-mile length in Georgia through heart of Lawson Air Base and main Fort Benning Post, lifting from ground short distance east of military reservation. Terrific winds up to 120 m.p.h. caused great destruction of property and disruption of military activities. About 80 percent of all property in storm path suffered varying degrees of damage; heavy to total losses to 18 airplanes, 82 military buildings, numerous barracks, housing units, and other buildings; moderate damage to 677 other buildings; a 250-foot parachute jump tower destroyed. Fallen trees, broken utility lines, and debris littered entire path of storm through post.
Extreme western Taylor County to Macon, Ga.	13	10-11:35 p.m.	100-500	50	5	75	3,175,000	Minor	do	Path practically in same line with earlier tornado at Fort Benning; moved east-northeastward, lifting and hitting again several times. Began near Howard Community, continuing through Mizzell and Crowell Communities in Taylor County, Roberta, Knoxville, and Sowell Communities in Crawford County, then into Bibb County through Lizella Community and through heart of city of Macon via sections of Napier, Cherokee Heights, Vineville, North Highlands, Baconfield Park, Clinton Street, and North Clinton Road, terminating just beyond northeast city limits of Macon. Very heavy losses concentrated in Macon with 100 homes destroyed, 150 heavily damaged, and 500 or more others with lesser damages, and more than 3,000 families inconvenienced. Losses in Taylor and Crawford Counties included 50 homes destroyed and 100 or more damaged.
Taylor County (northeastern portion), Ga.	13	10:30 p.m.	100-400	3-4	0	0	7,500	Slight	do	Occurred simultaneously with preceding tornado, moving east-northeastward, and 2 miles below it in a parallel course. Struck first in Turner Chapel Community, where 2 homes destroyed and several damaged. Continued beyond Ficklins Mill, where damages moderate, then lifted or dissipated.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Extreme eastern Taylor County to extreme western Twiggs County, Ga.	13	10:30-11:45 p.m.	100-500	30-35	1	Several	$20,000	Slight	Tornado	Followed parallel course to 2 preceding tornadoes, moving east-northeastward, lifting and hitting again several times. Began near Reynolds in Taylor County, then through mostly rural pasture and wooded areas of Crawford, Peach, Houston, and Twigg Counties, with moderate to heavy damages to property near Byron in Peach County, Centerville and Elberta in Houston County, and near Bullards in Twiggs County. Storm lifted from ground or dissipated soon after crossing into Twiggs County.
Springfield (3 miles north of), Orangeburg County, S. C.	14	2 a.m.		**700			8,000		Wind	This area is 12 miles east-northeast of White Pond.
White Pond, Aiken County, S. C.	14	2:10 a.m.	800	1		4	100,000		do	Showed tornadic manifestations. Lateness of hour probably prevented seeing or hearing this storm. Evidence of tornadic action.
Pitt County, N. C.	14	Early morning					500		do	Tobacco barn and garage damaged in outskirts of Greenville. A few breaks in power lines.
Pottstown (near), Pa.	14					1			Electrical	Lightning shattered tree, furrowed ground, and gave several minor shocks. Man deaf for 24 hours.
Kobuk, Alaska	14	Evening					500		Wind	An intense storm moving northeastward, into northern Bering Sea, coupled with high pressure over Territory, caused strong southeasterly winds along northern Bering Sea and Kotzebue Sound coasts and in Kobuk River Valley. Wind caused damage to roofs at Kobuk. At Wales peak gust of 87 m.p.h. from south-southeast recorded on 13th and gust of 106 m.p.h. from southeast on 14th. 24-hour average wind speeds at Nome and Kotzebue on 14th 26.4 and 37.4 m.p.h., respectively.
Siglerville (near), Pa.	15	9 p.m.			0	0			Tornado	Funnel-like cloud reported, which unroofed haymow, felled fence, and scattered straw bales.
Adelanto, San Bernardino County, Calif.	16	8 a.m.-5 p.m.							Wind	Several buildings damaged by strong winds which loosened tiles.
George Air Base (5 miles north of Victorville), San Bernardino County, Calif.	16	8 a.m.-5 p.m.					3,800		do	At Victor Housing project winds damaged asbestos shingle roofs. Some TV antennas blown down.
Southern portion of San Joaquin Valley, within 15-mile radius of Bakers field, Calif.	16	10 a.m.-2 p.m.	*30	30			600,000		do	Strong winds damaged television antennas, carports, roofs, and porches. Storm moved westward.
Atlanta (2 miles southwest of), Nebr.	17	Afternoon					800		do	Wind blew car and house trailer off road, wrecking trailer.
Vicksburg, Miss	17	3:10 p.m.	3	**50	0	0	500	$0	Whirlwind	Tore down part of wood and metal wall; moved westward.
Colorado, eastern and central portions	17-18		*300	300	1	4	75,000	3,000,000	Wind, snow, and dust	Conditions similar to storm of 10th to 12th, only over larger area with heavier damages and losses. Death and injuries result of strong winds.
Conway Springs (3 miles northeast of), Sumner County, Kans.	18	10:30 a.m.			0	0	1,000		Tornado	Earliest of a number of spot tornadoes or destructive windstorms to develop along squall line as it moved through eastern Kansas. Funnel observed; barn destroyed.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Durham (4 miles west of), Marion County, Kans.	18	11 a.m.					$150		Wind (possible tornado)	Spot wind damage along squall line.
Herington, Dickinson County, Kans.	18	11:15 a.m.			0	0	5,000		Tornado	Along squall line. At least 3 funnels sighted moving northeastward in Herington area, 1 of which touched ground.
Junction City (4 miles west of), Geary County, Kans.	18	11:35 a.m.	440	2	0	0	1,700		do	Developed along squall line. Farm buildings damaged. Funnel not identified, but debris indicated tornado. Minor damage in Junction City.
Cottonwood Falls, Chase County, Kans.	18	11:55 a.m.					3,000		Wind (possible tornado)	Developed along squall line. Damage to grandstand suggests tornado, but funnel not sighted.
Allen (3 miles south of), Lyon County, Kans.	18	12:15 p.m.	440	2	0	0	300		Tornado	Developed along squall line. Barn destroyed. Funnel aloft seen.
Manhattan (15 miles northwest of), Riley County, Kans.	18		33	1/4	0	0	2,500		do	Developed along squall line. Farm buildings destroyed. Funnel not seen, but damage indicated tornado. Time reported 12:20 p.m., but appears questionable.
Eskridge (7 miles south of), Wabaunsee County, Kans.	18	12:25 p.m.			0	0	1,000		do	Developed along squall line. Barn destroyed. Funnel not seen, but damage definitely indicates tornado.
Harveyville (6 miles south of), Lyon County, Kans.	18	12:30 p.m.			0	0	500		do	Developed along squall line. Farm Buildings damaged. Damage indicates tornado.
Shawnee County, Kans.	18	1:10 p.m.			0	0	5,000		Tornado and wind	Developed along squall line. Funnel aloft seen 1 mile north of Wakarusa. At least 4 wind damage spots in Topeka vicinity, but funnels not positively identified.
Overbrook, Osage County, Kans.	18	1:15 p.m.			0	0	1,000		Tornado	Developed along squall line. Farm buildings damaged. Debris indicated tornado.
Hiawatha, Brown County, Kans.	18	1:15 p.m.	133	2½	0	0	500		do	Developed along squall line. Funnel seen and roar heard.
Horton, Brown County, Kans.	18						1,000		Wind (possible tornado)	Developed along squall line. Selective aircraft damage at airport suggests tornado.
Winchester (3½ miles south of), Jefferson County, Kans.	18	1:30 p.m.	100		0	0		$0	Tornado	Developed along squall line. Several farm buildings destroyed. Funnel seen.
Talmage, Nebr.	18	Afternoon			0	0	0	0	do	Tornado cloud passed over town, but did not reach ground.
Nebraska, southwestern portion	18								Dust	Dust restricted visibility to a few yards at times and was a contributary cause of automobile accidents with damage estimated at $1,100.
Connersville, Fayette County, Ind.	19				0	0	10,000	0	Tornado	Roofs severely damaged on 3 or 4 houses and a church.
Kirklin, Clinton County, Ind.	19	P.m.			0	0	1,500	0	do	2 trucks blown across road, 1 completely wrecked. Several trees downed. Storm termed "mild tornado" by newspapers. Moved eastward.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Arlington and Dayton, Ohio	19	6:45-7:45 p.m.					$42,500		Wind	Strong winds damaged 10 homes in Arlington ($35,000) and caused $7,500 property damage in Dayton area.
Laurelville and Adelphia, Ohio	19	8:50 p.m.	100	1	0	0	47,000	$3,000	Tornado	Lifted roofs, leveled garages and barns, and killed 4,000 chickens. Storm from southwest and associated with squall line which struck Arlington and Dayton, a short time before.
Cynthiana and vicinity, Harrison County, Ky.	19	P.m.					5,000		Wind	2 barns leveled; roofing torn from residences; trees, chimneys, and signs blown down.
Centre County, Pa.	20	Morning							do	Strong gusty winds from south overturned and demolished implement shed near State College.
Off South Carolina Coast	20	During day			2	3			do	2 crewmen killed and 3 injured on Panamanian Tanker Sabrina.
Mt. Lemmon-Rillito Creek, Pima County, Ariz.	21-23						5,000		Rain	Rains averaged as high as 9.50 inches during storm on Mt. Lemmon. High waters in washes and canyons on west side of Mt. Lemmon resulted in some localized road and recreation area damage in Sabino Canyon and along Rillito Creek.
Maricopa County, Ariz.	22-25						50,000		do	Considerable flooding of primary and secondary roads during period. Some concentration of road washouts in Queen Creek area.
Graham, Greenlee, Gila, and Navajo Counties, Ariz.	22-25						40,000		do	Heavy rains in mountainous regions caused some primary and some secondary road damage.
Logan County (southeastern portion), Colo.	24	1-1:05 p.m.	*2	12	0	1	5,000	0	Tornadoes and hail	From 1 to 3 funnel clouds observed moving northeastward. Some light hail accompanied storm.
From Meno to Goltry to Jet, Major and Alfalfa Counties, Okla.	24	3:15-3:40 p.m.	*3	31	0	0	10,000	5,000	Tornado, hail, and winds	Hail, up to size of golf balls, covered ground to 1 inch deep; lasted about 15 minutes. Tornado funnel observed in Goltry area covering path about ½ mile wide.
From 4 miles east-southeast of Alfalfa to east-northeast of Alfalfa, Caddo County, Okla.	24	3:30 p.m.	75	3	0	0	25,100	4,900	Tornado	Several farmsteads damaged. Horse lifted into air.
Harper and Sumner Counties north to southern McPherson County, Kansas	24	3:55-5:50 p.m.	220				409,000		Hail and wind (possible tornado)	Storm moved north-northeastward, with hail stones ranging up to size of turkey eggs and coverering ground locally to depth of 4 to 6 inches. Wind and hailstorm caused considerable damage in the following communities: (1) 3:55-4:18 p.m., Bluff City (southeastern Harper County) to Argonia (west-central Sumner County), damage $100,000. (2) 4:15 p.m., Clearwater area to north of Maize (central Sedgwick County), damage $9,000. (3) 4:45-5 p.m., much of Harvey County except northeast. (4) 5:20-5:40 p.m., Moundridge (McPherson County) and surrounding areas, damage $300,000. Report of tornado observed aloft 4 miles south of Cheney (Sedgwick County) but not confirmed.
Fort Sill (10 miles north of), Comanche County, Okla.	24	5:05-6 p.m.	150				1,000		Winds	13 boats picked up and tossed around. Peak gust reported at Ft. Sill was 60 m.p.h. at 5:30 p.m.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
East-central Lyon County, northwestern Coffey County, and southern Osage County, Kans.	24	6:30-7 p.m.	*2-4	25			$50,000		Hail	Storm moved east-northeastward with hail varying in intensity. Considerable local damage from stones up to 2 inches in diameter.
Cleveland, Pottawatomie, and Oklahoma counties, Okla.	24	6:30-8 p.m.	Wide		0	0	10,000	$0	Winds and tornado clouds	4 farmsteads damaged in Cleveland County near Moore. Winds up to 76 m.p.h. 2 warehouses in Oklahoma City damaged. TV transmitter tower blown down. Funnel clouds observed over Tinker Field, also near Wellston. Accompanied by hail and heavy rains which caused no damage. Minor tree damage in southern part of city of Shawnee.
Throckmorton, Throckmorton, County, Tex.	24	6:30 p.m.	*1	5			2,500		Wind	Several sheds and small barns blown over.
Albany, Shackelford County, Tex.	24	7 p.m.				1	3,000		do	3 barns and 1 garage damaged. 1 haystack blown away. No crops in fields. Man injured by piece of roofing.
Newkirk (3 miles north and 1 mile west of), Kay County, Okla.	24	7:05 p.m.	200	3	0	0	9,700	300	Tornado	Path northeastward. Funnel observed by several persons.
Brownwood, Brown County, Tex.	24	8 p.m.							Wind and hail	Greenhouses, neon signs, and windows damaged; trees uprooted. 2 garages blown down and TV antennas bent.
Northeastern Franklin, southeastern Douglas, and northwestern Miami Counties, Kans.	24	8:30 p.m.	Narrow		0	0	8,200	0	Tornado and Electrical	At least 3 farms suffered damage to barns and sheds from tornado. Barn and contents of hay and livestock burned from lightning strike. Tornado damage, $2,000; electrical damage, $6,200.
Northeastern Wilson, northwestern Neosho, and southwestern Allen Counties, Kans.	24	9 p.m.	*½-1	20	0	0	18,000	1,000	Tornado, wind, and electrical	Local damage to farm buildings in east-central Wilson County probably from incipient tornado; path of damage discernible from air beginning 4 miles northwest of Chanute northeastward into Allen County. Barn in Wilson County burned from lightning.
Seminole County (southern part) and Pottawatomie County (southeastern part), Okla.	24	9 p.m.	Wide				4,500		Hail and wind	In Sasakwa, Konawa, and Sacred Heart areas. Hail, golf-ball size, caused severe damage to roofs. 1 barn and several small buildings blown down, and several buildings damaged by high winds.
Tulsa and vicinity, Tulsa County, Okla.	24	9:05-9:20 p.m.	Narrow	4		1	100,000		Winds	Damage to aircraft, drive-in theatre, lumber company, and several residences.
Sapulpa, Creek County, Okla.	24	9:15-9:30 p.m.	200	3	0	0	2,500	0	Tornado	Moved north-northeastward, damaging garages and other buildings.
Argyle, Denton County, Tex.	24	9:15 p.m.			1		500		Wind and hail	Slight damage to building roofs, signs, and trees. Wing of drive-in theater blew over and killed man.
Fort Worth, Tarrant County, Tex.	24	9:15 p.m.	*several	100					Wind	Some damage to moored light aircraft and hangar doors at Meacham Field; some electric lines knocked down.
Muskogee and Wagoner Counties, Okla.	24	9:25-9:30 p.m.			0	0	70,000	0	Tornado and winds	Tornado struck Haskell in narrow path about a mile long at 9:25 to 9:30 p.m., damaging several residences and cannery with $50,000 damage. Winds estimated up to 70 m.p.h. damaged several buildings, boats, and other property throughout Wagoner County.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Cherryvale (5½ miles southeast of), Labette County, Kans.	24	9:30 p.m.	440	2	0	0	$15,000	$0	Tornado	Funnel cloud observed to rise and lower as it moved eastward to destroy or damage buildings and uproot trees on several farms.
Frisco, Collin County, Tex.	24	9:30 p.m.	*3	5	0	0	12,000	0	do	Tornado moved eastward. 1 grain elevator completely demolished; windows blown out and houses unroofed; barns, sheds, and TV antennas damaged.
McKinney, Collin County, Tex.	24	9:37 p.m.	*5	46			75,000	2,000	Wind	Winds estimated at 100 m.p.h. Steeple of church toppled. Some buildings unroofed; plate-glass windows broken. TV antennas and electric lines blown down. Some other damage in county, but was centered at Frisco and McKinney.
Bourbon County (northeastern portion), Kans.	24	9:45 p.m. and 10:30 p.m.					25,000		Electrical	2 large barns, 3 miles northeast and 6 miles north of Fort Scott, respectively, burned from lightning strikes.
Cherokee County, Kans.	24	9:45 p.m.	17						Wind (possible tornado)	Drive-in screen and hangar with 4 planes at Columbus demolished. Farm buildings 6 to 8 miles east destroyed by winds described as tornadic by press.
Lamar, Barton County, Mo.	24	10 p.m.			0	0	°100,000		Tornado	Outbuildings, barns, and several frame homes demolished or severely damaged. Several cattle killed or injured. Power and telephone services disrupted. Tornado moved northeastward.
Burgess, Jasper County, Mo.	24	10 p.m.			0	0	2,000	0	do	Damages to garage and loose farm equipment.
From south and east of Rose to near Jay, Delaware County, Okla.	24	10 p.m.	Narrow	20	0	0	7,500	0	do	3 farmsteads damaged.
Craig, Mayes, and Delaware Counties, Okla.	24	10:18 p.m.	50	6	0	0	20,000	0	do	Path northeastward from west of Pensacola along line northeastward to shoreline of Grand Lake.
Choctaw County and southern half of Pushmataha County, Okla.	24	10:30-11:20 p.m.	*20	40			100,000		Winds	About $50,000 damage in southern half of Pushmataha County and about $50,000 damage in Choctaw County in Boswell, Soper, Spencerville, and scattered areas.
Honey Grove, Fannin County, Tex.	24	10:30 p.m.	*8	20		1	30,000		Wind	Compress almost destroyed; filling station demolished. Electric lines blown down. Roofs and windows damaged.
Illinois, northern and central portions	24-25	Night					200,000		Rain	Heavy rains, totaling up to 5 inches, covered area from Hancock, Henderson, and Mercer Counties along Mississippi River northeastward through Cook, Will, and Kankakee Counties. Streets and basements flooded in many communities, and some streams went over their banks.
Texarkana, Ark.	24	10:30 p.m.							Wind	Planing mill building, 30 x 60 feet, destroyed.
Benton County, Ark.	24	10:40 p.m.	400	20	0	4	10,000	0	Tornado	Storm first reported at Centerton, reached Bentonville area at 11:15 p.m. and last reported at Twelve Corners Community in northeastern corner of County. Path northeastward. Several homes, barns, and outbuildings destroyed or damaged. A considerable number of chickens killed.
Chadwick, Christian County, Mo.	24	11 p.m.	*1½	20			°1,000		Wind	Damages to fruit trees, roofs, windows, and small outbuildings.
Purdy, McDowell Fairview, Washburn, Flat Creek and Cato, Barry County, Mo.	24	11 p.m.			0	2	°25,000		Tornado	Damages to trees, barns, small frame houses, and loose equipment. Debris along highways obstructed traffic for several hours

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Ozark and Elk Valley, Christian County, Mo.	24	11-12 p.m.	900	5	0	0	°20,000		Tornado	Extensive damage to barns, outbuildings, and equipment. Several cattle killed or injured. Debris blocked highways for several hours.
Success and Fairview in Texas and Newton Counties, Mo.	24	11 p.m.			0	0	°25,000		do	Broiler houses damaged, outbuildings destroyed, barns levelled, household furniture and farm equipment destroyed or damaged. 3,000 to 4,000 pullets and other poultry killed or injured. Trees uprooted and tossed several yards.
Lanagan, Rocky Comfort and Oshkosh in Newton and McDonald Counties, Mo.	24	11 p.m.			0	1			do	Several small frame farmhouses damaged or destroyed. Small barns and outbuildings levelled. Cattle and poultry killed or injured in vicinity of tornado path. Tornado track northeastward.
Fordland and 8 miles north of Seymour, Webster County, Mo.	24	11 p.m.			0	0	°20,000		do	Warehouse demolished, 3 or 4 barns damaged or demolished. Approximately 20 cows killed and many others injured. Trees uprooted and blown across highways and roads.
Bellfont, Harrison, and Valley Springs areas, Boone County, Ark.	25	12:45 a.m.							Wind	Telephone and electric power services disrupted; 300 phones out of order. Damage to houses, barns, outbuildings and trees.
Between Centerton and Hiwasse, Benton County, Ark	25	2:15 a.m.			0	0	$5,000		Tornado	Storm destroyed brooder house and other outbuildings, and damaged home. 3,000 baby chickens killed.
Gray Summit, Franklin County, Mo.	25	1-2 a.m.		20	0	0	5,000	$0	do	Extensive damages to brick house; walls capsized in several houses. Power and telephone services disrupted.
Bendavis (near Houston), Texas County, Mo.	25	1 a.m.	100	15	2	0	°35,000		do	Frame house where couple killed was completely demolished. Bodies found 150 yards from house. Barns, outbuildings, and 1 truck damaged beyond repair. Trees uprooted and tossed several yards.
Pacific (south of), near junction of St. Louis, Franklin, and Jefferson Counties, Mo.	25	2 a.m.	30	3	0	0	20,000	0	do	Damages to barns, roofs, windows, and farm equipment along 3-mile path of tornado. Path east-northeastward.
West Alton (west of), St. Charles County, Mo.	25	2 a.m.	60	1	0	0	5,000	0	do	Porch roof torn off; outbuildings tipped from foundations. Other minor structural damage. Tornado path east-northeastward.
Gilmore and West of Portage Des Sioux, St. Charles County, Mo.	25	2 a.m.	*2	20	0	0	35,000	0	do	House levelled at Gilmore; 2 small cottages moved completely off cement foundation to which they were bolted. Barns and sheds unroofed. 3 small aircraft damaged and corner of hangar at Smartt Field torn. Debris blocked many roads.
St. Charles, Mo.	25	2 a.m.					10,000		Wind	Power and telephone services disrupted. TV antennas blown away. Windows, roofs, and sidings damaged.
St. Louis and St. Louis County, Mo.	25	2 a.m.					80,000		do	Power and telephone services disrupted. Windows, sidings, roofs, signs, and trees damaged.
St. Albans, Chesterfield, Lake, to near Maryland Heights, St Louis County, Mo.	25	2 a.m.	20	10	0	0	20,000	0	Tornado and Electrical	Lightning ignited and burned part of building. Brick house, concrete block garage, and several barns demolished. Tornado moved east-northeastward. Distinct rumbling and roaring noise heard.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Illinois, northern three-quarters	25	Morning			1	10	$1,000,000		Wind	Heaviest damage in strip about 75 miles wide from St. Louis area northeastward to Vermilion and Edgar Counties. Considerable damage also in northeastern quarter of State, especially near Kankakee. Taylorville hardest hit community, soffering $200,000 property loss. Girl killed at Pekin by falling tree limb.
Corry, Pa.	25	9 a.m.							Electrical	Lightning struck TV aerial, damaged TV equipment, burned out lights, and knocked out small balls of hot plaster which caused burn marks in several rooms.
Gary, Lake County, Ind.	25	A.m.				1	500		Wind	Wind blew out large store front plate-glass window and flying glass injured pedestrian.
Fort Wayne, Allen County, Ind.	25	All day					1,500		do	Large tree blown onto roof of house, damaging roof and 2 or 3 rooms. Numerous TV antennas and several light poles blown down, street light globes broken, etc.
Harlan County, Ky.	25						1,500		do	Conveyor line blown down at coal mine and several utility lines down in scattered sections of County.
Ohio, western and northern portions	25	Day							Rain and wind	Heavy rains caused thousands of dollars damage to basements. Strong winds lifted roofs, downed trees and utility lines (few on cars), broke windows, and toppled TV aerials. $20,000 damage in Cleveland area alone. Over 2 inches of precipitation in 24 hours in Cleveland.
Wisconsin, eastern and southern portions	25	Day				29	200,000		Wind	Southwesterly gales with gusts in excess of 80 m.p.h. caused considerable property damage of minor nature. Trees, wires, roofing, doors, antennas, and windows bore brunt of damage. In Milwaukee a 100-foot long wood and steel canopy on building construction job blown to ground, injuring 4 people and damaging car. In Milwaukee County more than 25 persons injured and about 25 large trees downed.
South Bend, St. Joseph County, Ind.	25	P.m					5,000		do	20 trees blown down; plate-glass window blown out; roofs and TV antenna damaged.
Logansport, Cass County Ind.	25						500		do	TV antenna downed; large tree limb blown onto house punching a 2-foot hole in building; chimney blown down.
Hammond, Lake County, Ind.	25						5,000		do	TV antenna downed; shingles blown from roofs; some trees blown over; and plate-glass windows blown out.
Bluffton Wells County, Ind.	25						500		do	Several utility poles blown down.
Wabash, Wabash County, Ind.	25						5,000		do	TV antenna downed, trees damaged, etc.
Muncie, Delaware County, Ind.	25						500		do	Roof blown off.
Coatsville, Hendricks County, Ind.	25						500		do	Large section of roof of farm supply shop blown off.
Frankfort, Clinton County, Ind.	25	4 p.m.					1,000		do	Plate-glass windows blown out, TV antennas bent, etc.
Bourbon, Marshall County, Ind.	25	6:15 p.m.				1	6,000		do	TV antennas downed. Man knocked unconscious and hospitalized when wind slammed door against him. 3 cars damaged by falling tree limbs.
Chesterton, Porter County, Ind.	25	P.m.					8,000		do	Roofs damaged; trees and tree limbs blown on telephone lines, disrupting service; TV antennas downed.
Elkhart, Elkhart County, Ind.	25	P.m.					6,000		do	At least 70 TV antennas and 20 trees blown down. Damage to billboards, telephone lines, etc.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Michigan, lower portion	25	P.m.							Wind	Quite general winds of hurricane speed, damaged or destroyed windows, signs, roofs, television antennas, and fragile small buildings.
Tuskegee, Ala.	25	P.m.			1		$300		Electrical	Lightning apparently passed through light cord and struck woman while she was preparing a meal. Corner of house damaged and part of chimney knocked off.
Millbury, Mass.	27	2 p.m.	17	**900			1,500		Dust devil	Dust devil, mistakenly described as miniature tornado by witnesses, whirled across small area of Millbury, lifting glass, sand, and tar paper into air. Several persons told of seeing black debris-laden cloud, hearing a "terrific roar", and watching wind lift tar-paper roof from small shed and break windows in a greenhouse.
Millville, Worcester County, Mass.	27	2 p.m.							do	This dust devil probably produced by same type of conditions that caused same phenomenon a few minutes earlier at Millbury, Mass., which is about 14 miles northwest. Disturbance caused automobile to bounce up and down. Air filled with dust, trash, and tree branches as freak wind was disappearing in sky.
Toombs County (southern portion), Ga.	27	Late afternoon	2	6			4,000	$1,000	Wind and hail	Wind squalls affected about 25 square miles in south-central Toombs County, affecting communities of South Thompson, Hardens Chapel, Spell, and New Branch. 2 homes badly damaged with moderate to heavy damages to several roofs, porches, barns, and other property. Heavy hail accompanying storm seriously damaged onions and other young plants throughout area.
Iowa, Central portion	28-29				3	Several			Snow	After a mild and open winter many drivers unprepared for late season snowstorm which left roads slippery across State from west to east.
Erie, Pa.	28	Afternoon					6,000		Electrical	Lightning struck and fired a home during a thunderstorm.
Columbus and Washington Court House, Ohio	28	Afternoon							Hail and wind	Columbus area damage caused by strong winds and Washington Court House area damage by combination of strong winds and hail (as large as 2 inches in diameter). Wind destruction confined to utility lines, signs, trees, and roofs. No report of hail damage.
Anderson, Madison County, Ind.	28	4:50 p.m.	35-70	1½	0	2	750,000	0	Tornado	Homes twisted from foundations; several homes flattened; roofs badly damaged. Packing plant badly damaged. Storm moved east-southeastward through residential and business section. Funnel and roar reported by many witnesses.
Home Place, Hamilton County, Ind.	28	10:30 p.m.					2,000		Electrical	Home struck by lightning. Roof and plastering severely damaged.
New Castle, Henry County, Ind.	28	P.m.					6,000		do	5 homes damaged by lightning.
New York, western, central and northern counties	29-30				12		See remarks		Snow	An unusually heavy fall of snow for so late in season, with depths ranging from 12 to 18 inches. Drifts of 3 feet or more. Snow was contributory cause of 12 deaths, most of which from over-exertion and heart failure. Traffic temporarily impeded, but monetary loss insignificant. Many schools closed for a day or so.
Headland, Ala.	29	2:30 p.m.	100	1¼	0	0	10,000		Tornado	Funnel-shaped cloud observed by several people on ground and by airplane pilot flying at altitude of 1,000 feet some 3 or 4 miles west of tornado. Trees uprooted; several homes damaged, as well as several barns and a church; telephone and power lines blown down.
Ohio, northwestern portion	29	Afternoon and night			5	Many			Ice, snow, and electrical	Rain or snow changing to freezing rain or snow plus scattered electrical thunderstorms caused much property and crop damage by fires to barns. Damage also caused by auto accidents, collapsing of roofs and utility lines due to weight of snow and ice. 10 inches of snow covered Toledo area. Highways dangerously slippery and many schools closed.
New England, central and northern portions	29-30	Evening, 29th-early evening, 30th			2	10			Snow, sleet, ice (glaze) and rain	Storm produced by wave disturbance on cold front extending south of New England. Heavy snow (more than a foot) fell over interior parts of New Hampshire and Vermont and in an east-west belt across central Maine. In central New England, mixture of snow, sleet, freezing rain, and rain caused very dangerous driving conditions and numerous accidents. Deaths resulted from skidding accident in Winthrop, Me.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Brooksville, Bracken County, Ky.	29	11 p.m.					$1,500		Electrical	Lightning struck house and started fire. Nearly all window panes broken, plaster knocked down, and part of roof torn off.
Winnsboro, S. C.	31	10 a.m.					250		Wind	Severe thunderstorms over State on 31st. Diligent inquiries and perusal of newspaper clippings failed to show, in any instance, that an actual tornado was involved. Winds estimated at 65 to 80 m.p.h. for a 1 to 5 minute period in short gusts. Practically all damage at Cayce confined to chemical plant.
Kershaw, S.C.	31	10 a.m.					10,000		do	
Darlington, S.C.	31	10 a.m.					750		do	
Yuma, Colo.	31	1 p.m.			0	0	1,000	$0	Tornado	Damage limited to small buildings and roofs.
Otis (near), Colo.	31	1 p.m.			0	0	0	4,000	Tornado and hail	Disturbance of moderate intensity. Some moderate hail accompanied storm. Damage mostly to crops.
Ball Ground, Ga.	31	3:30-3:45 p.m.	800	5		1	5,000	Slight	Wind	Struck 3 miles west of Ball Ground, moving eastward through south portion of Ball Ground. 1 house badly damaged by falling tree; several chicken houses destroyed; numerous trees broken or blown down. Storm effects disappeared a short distance east of Ball Ground.
Gainesville, Ga.	31	3:30 p.m.	400 or more	Short	0	0	30,000	Slight	Tornado	Funnel cloud observed. Struck small area about 5 miles north-northwest of Gainesville, moving toward east. Substantial damage to timber; 2 large poultry houses destroyed and about 3,000 chickens lost; roof of dwelling blown off; barn shaken off its foundation; other property damages.
Jefferson, Ga.	31	3:30-5 p.m.	Local	Local			1,200	None	Wind	High winds in area of about 7 square miles caused general minor damages to building roofs and moderate damages to small buildings, radio aerials, and other property.
Commerce, Ga.	31	3:50-4:15 p.m.					15,000	None	do	Strong straightline winds caused substantial damages to home and business house roofs, damaged transformers and utility lines, broke out windows including plate-glass windows; several buildings appreciably damaged, 1 from falling tree.
Dawson County (extreme southern portion), Ga.	31	4 p.m.	*1 or less	10			3,500	Slight	do	Moved eastward in rural sections from near Barrettsville Community almost to eastern county line. Many trees and some utility lines blown down, 1 home badly damaged, with other damages to barns, chicken houses, farm machinery, and some chickens lost.
Danielsville to Dewey Rose, Ga.	31	4:15-4:30 p.m.	200 or more	18	0	25	300,000	Slight	Tornado	Struck first near Danielsville, central Madison County, where only moderate damages to roofs, utility lines, and trees resulted. Storm then continued eastward and lifted from ground, striking again in Elbert County at Dewey Rose Community where school building and 2 nearby homes demolished; heavy damage to several other buildings; numerous trees and utility lines blown down; 2 cows and 4,000 chickens killed; and extensive minor damages to other property. Storm apparently lifted a short distance east of Dewey Rose.
Iva, S. C.	31	4:30 p.m.					3,000		Wind	See remarks for Winnsboro, Kershaw, and Darlington, S. C., also on 31st, above.
Abbeville, S. C.	31	4:45 p.m.				1	3,000		do	
Antreville, S. C.	31	5 p.m.					2,000		do	
Lexington, S. C.	31	5:45 p.m.				2	2,000		do	
Cayce (suburb of Columbia), S. C.	31	5:52 p.m.					100,000		do	
Orangeburg, S. C.	31	7 p.m.				1	3,000		do	
Ocean Drive Beach, S. C.	31	8:30 p.m.					1,250		do	

* Miles instead of yards.
** Yards instead of miles.
° Crop damage included with other property damage.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

MARCH 1954

Flooding during March was mostly light or minor. The Scioto River reached a new record low stage for March.

LAKE MICHIGAN DRAINAGE.--Heavy rains ranging from 2 to 3 inches accompanied by thunderstorms on the 25th caused rapid rises in the Grand River Basin. Minor rises occurred on the Grand River at Portland, Ionia, Lowell, and Grand Rapids, Mich. No damage was reported other than the inundating of several roads in the north portion of Grand Rapids. Flash floods occurred on Buck and Plaster Creeks, in the southern and southwestern parts of Grand Rapids, isolating homes and trailers for several hours and forcing 12 to 15 families to take up temporary shelter. A section of the Pennsylvania Railroad tracks was washed out near Ross station.

ATLANTIC SLOPE.--The light flooding on the Chemung River on the 2d was due to the moderate to heavy precipitation that fell during the afternoon and evening of the 1st. The precipitation averaged 1.17 inches over the entire basin. No damage was reported.

This same storm caused light flooding in the extreme headwaters of the Juniata River (Frankstown Branch) in Pennsylvania late on the 1st and in the West Branch on the 2d due to heavy rainfall. Most of the precipitation fell in less than 12 hours during the late morning and afternoon of the 1st, with storm totals averaging about 2 inches. Moderate rises well below flood stage, were experienced on the main stem of the Susquehanna River. Flood damages were light, occurring mostly to dwellings and roads in low spots in Blair, Bedford, Huntingdon and Lycoming Counties.

The minor flooding in the James and Potomac Basins between the 1st and 4th was due to heavy precipitation during the morning of the 1st. The storm lasted less than 12 hours. The precipitation ranged from 2 to 3 inches over the Potomac Basin and from 1 to 3.5 inches over the James River Basin. No damages were reported from the overflows. In the James River Basin in Craig and Botetourt Counties of Virginia tributary high waters inundated low bridges and rushed through open fords making them impassable. The usual cessation of towing operations, due to stepped-up current, occurred in the Richmond harbor.

Heavy showers in the afternoon of February 28 and the morning of March 1 caused minor local flooding on the Roanoke and Neuse Rivers in North Carolina. The precipitation averaged 1.5 inches in the Roanoke Basin, 0.9 inch in the Tar Basin and 1.1 inches in the Neuse and Cape Fear Basins. Additional heavy rain on the 13th and 14th caused minor local flooding on the Neuse and Cape Fear Rivers. No damage was reported.

The Santee River at Rimini, S.C., was above bankfull stage all month, due to backwater from Santee-Cooper Dam. Minor flooding occurred on the Saluda River at Pelzer, S.C., on the 28th and 29th.

EAST GULF OF MEXICO DRAINAGE.--The minor flooding on the Pearl River between March 29 and April 6 was due to heavy rainfall which began during the night of the 26th and continued intermittently through the 27th. Rainfall in excess of 3 inches occurred at several stations on the intermediate reaches of the river. No damage was reported from the flooding.

UPPER MISSISSIPPI BASIN.--The flooding on the Illinois River at Morris and LaSalle, Ill., between the 25th and 27th was due to heavy rain (2.75 inches) in the upper basin on the 25th. No damage resulted.

MISSOURI BASIN.--The flooding on the Little and Big Sioux Rivers and the Floyd River in Iowa between the 18th and 24th was due primarily to runoff from accumulated snow. Snowfall had accumulated to depths ranging from about 4 to 10 inches over the upper half of the Floyd Valleys, and also east of the Big Sioux River and from around Akron, Iowa, to near Flandreau, S. Dak., during the first half of March. Mild weather on the 17th and 18th caused the accumulated snow to melt quite rapidly in the headwaters. Rainfall on the 18th and 19th was light but did help to move the snow cover into the rivers. Flood damage was negligible.

OHIO BASIN.--The only flooding reported in the Ohio Basin during March was on the Tygart River at Dailey, West Virginia, on the 1st and 2d. This overflow was due to snow melt and rain. No damage resulted.

In contrast, the Scioto River set a new low-record stage of 0.3 foot at Piketon, Ohio, for March on the 2d, 3d, and 4th. At Circleville, Ohio, the Scioto River reached a stage of 2.2 feet on the 19th to equal the record-low stage for March which was established in 1938.

PACIFIC SLOPE DRAINAGE.--The highest stages of the season occurred on the Feather, Yuba, American, and lower San Joaquin Rivers during March, but they were well below flood stage. These high stages were due to heavy rain from the 8th to the 10th which brought more than one-half the normal precipitation for the month to most stations. The runoff brought flow over two of the five weirs of the Sacramento River. Two head of cattle were drowned on the lower Feather River.

FLOOD STAGE DATA

Table 5 (All dates in March unless otherwise specified) MARCH 1954

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
	Ft.			Ft.	
ATLANTIC SLOPE DRAINAGE					
Chemung:					
Elmira, N. Y.	12	2	2	12.9	2
Chemung, N. Y.	12	2	2	14.7	2
West Branch, Susquehanna:					
Williamsport, Pa.	20	2	2	20.0	2
Frankstown Branch, Juniata:					
Williamsburg, Pa.	12	1	2	14.0	1
South Branch, Potomac:					
Springfield, W. Va.	15	1	2	16.0	2
Potomac: Washington, D.C. (near)	10	2	4	12.5	3
Jackson: Covington, Va.	7	1	1	10.0	1
James:					
Lick Run, Va.	18	1	1	19.0	1
Buchanan, Va.	17	2	2	17.6	2
Bromo Bluff, Va.	19	2	3	23.6	3
Columbia, Va.	18	2	3	23.7	3
State Farm, Va.	12	3	4	**14.5	3
Richmond, Va.	8	3	4	9.4	3
Roanoke: Randolph, Va.	21	1	2	22.5	2
Neuse:					
Neuse, N. C.	14	15	17	**14.8	17
Smithfield, N. C.	13	1 16	5 18	**15.5 14.5	3 18
Goldsboro, N. C.	14	4	9	**15.8	7
Cape Fear River:					
Lock No. 2., Elizabethtown, N. C.	20	15	17	22.5	16
Saluda: Pelzer, S. C.	6	28	29	7.8	28
Santee: Rimini, S. C.	12	1	31	14.3	
EAST GULF OF MEXICO DRAINAGE					
Pearl:					
Jackson, Miss.	18	31	Apr. 3	18.4	Apr. 1
Monticello, Miss.	15	29	30	15.3	29
Bogalusa, La.	15	29	Apr. 6	17.8	Apr. 2
Pearl River, La.	12	Apr. 5	Apr. 5	12.2	Apr. 5
MISSISSIPPI SYSTEM Ohio Basin					
Tygart: Dailey, W. Va.	9	1	2	11.0	Apr. 1
Upper Mississippi Basin					
Illinois:					
Morris, Ill.	13	25	26	**15.8	26
La Salle, Ill.	20	25	27	22.8	26
Missouri Basin					
Big Sioux: Akron, Iowa	16	21	24	18.1	22
Floyd:					
Merrill, Iowa	12	18	18	#12.4	18
James, Iowa	16	18	20	18.6	19
Little Sioux: Spencer, Iowa	10	18	21	12.1	18
PACIFIC SLOPE DRAINAGE Sacramento Basin					
Sacramento:					
Colusa Weir, Calif.	61.8	10 21	13 23	64.1 63.3	11 22
Tisdale Weir, Calif.	45.5	10 18 20	16 19 25	47.9 45.9 47.7	11 18 23
Feather: Fremont Weir, Calif.	33.8	10	16	35.7	12

* Provisional
** Highest stage reported but not necessarily the crest
# Estimated from hydrograph

RADIOSONDE DATA

Average monthly values

Table 20

MARCH 1954

Standard pressure surface (mb.)	ALBUQUERQUE, N. MEX. (835 MB.)				ATLANTA, GA. (981 MB.)				BISMARCK, N. DAK. (957 MB.)				BOISE, IDAHO (913 MB.)				BROWNSVILLE, TEX. (1014 MB.)				BUFFALO, N. Y. (988 MB.)				BURRWOOD, LA. (1017 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,619	8.2	34	30	309	11.1	62	31	505	- 4.2	79	31	868	4.7	53	31	7	18.2	82	31	221	- 0.4	73	31	3	15.8	83
1,000	31	91			30	149			31	149			31	117			31	124	17.7	79	31	102			31	144	15.9	72
950	31	535			30	582	10.5	53	31	559	- 5.1	68	31	545			31	566	17.4	66	31	519	- 1.4	63	31	587	13.8	63
900	31	993			30	1,028	8.4	54	31	984	- 5.2	66	31	986	5.7	44	31	1,025	16.9	46	31	942	- 4.2	64	31	1,033	11.7	[illegible]
850	31	1,466			30	1,498	6.0	51	31	1,431	- 7.1	64	31	1,451	2.9	42	31	1,511	15.2	39	31	1,391	- 6.4	59	31	1,510	10.4	42
800	31	1,967	6.7	31	30	1,993	4.2	40	31	1,902	- 8.4	59	31	1,939	- 1.1	46	31	2,023	13.6	34	31	1,863	- 8.2	54	31	2,014	9.1	36
750	31	2,496	2.5	35	30	2,522	2.6	34	31	2,408	-10.2	54	31	2,455	- 4.8	48	31	2,571	11.7	30	31	2,367	-10.1	51	31	2,551	7.2	29
700	31	3,046	- 1.9	40	30	3,073	.0	34	31	2,930	-12.8	52	31	2,989	- 8.5	51	31	3,138	8.8	26	31	2,892	-12.1	47	31	3,111	4.3	28
650	31	3,632	- 6.2	43	30	3,669	- 2.6	35	31	3,500	-15.8	48	31	3,569	-12.1	50	31	3,750	4.9	27	31	3,463	-14.6	47	31	3,714	1.1	29
600	31	4,252	-10.4	45	28	4,291	- 6.7	35	31	4,091	-19.5	47	31	4,169	-15.9	49	31	4,394	.0	30	31	4,059	-17.6	49	31	4,350	- 2.9	32
550	31	4,918	-14.5	41	28	4,966	-11.1	39	31	4,736	-23.6	44	31	4,821	-20.2	51	31	5,085	- 5.1	30	31	4,711	-21.2	48	31	5,033	- 7.4	35
500	31	5,632	-19.1		27	5,690	-16.3	40	31	5,421	-28.4	40	31	5,518	-25.0	51	31	5,827	-10.1	31	31	5,403	-25.8	45	30	5,771	-12.1	31
450	31	6,416	-24.5	37	25	6,482	-21.7	41	31	6,175	-33.7		31	6,281	-30.4	50	31	6,638	-15.9	30	30	61,58	-31.3	39	30	6,580	-17.5	
400	31	7,257	-30.2	40	25	7,331	-27.8	44	31	6,984	-39.5		31	7,102	-36.6	48	31	7,509	-22.5	34	30	6,973	-37.5		30	7,441	-23.7	
350	31	8,194	-36.5		25	8,277	-34.3	45	31	7,885	-45.8		31	8,013	-43.3		31	8,473	-29.8		28	7,886	-43.9		30	8,402	-31.1	
300	31	9,245	-44.0		23	9,342	-42.1		31	8,898	-51.6		31	9,035	-49.9		31	9,550	-38.5		28	8,905	-49.9		30	9,476	-39.4	
250	31	10,446	-51.9		23	10,550	-51.1		31	10,070	-54.6		31	10,211	-55.0		30	10,775	-48.6		28	10,084	-53.9		30	10,698	-48.8	
200	31	11,870	-57.3		23	11,974	-57.9		31	11,497	-53.4		31	11,630	-55.5		28	12,208	-58.7		24	11,504	-53.1		30	12,131	-58.2	
175	30	12,720	-58.2		22	12,808	-59.1		31	12,359	-51.9		31	12,485	-53.6		28	13,036	-62.6		21	12,365	-52.4		29	12,971	-61.3	
150	30	13,688	-58.8		22	13,771	-60.2		31	13,358	-51.7		31	13,477	-53.1		27	13,979	-65.0		21	13,359	-53.2		29	13,920	-64.1	
125	29	14,830	-61.1		19	14,909	-62.7		31	14,537	-52.3		31	14,649	-54.3		26	15,078	-69.1		15	14,512	-53..6		29	15,029	-66.9	
100	29	16,202	-64.9		19	16,276	-65.2		30	15,975	-53.8		30	16,074	-55.9		22	16,399	-73.6		11	15,933	-54.7		27	16,367	-70.0	
80	27	17,559	-64.2		15	17,618	-64.3		28	17,402	-54.8		28	17,486	-56.0		17	17,708	-74.0		10	17,361	-55.9		24	17,687	-69.6	
60	18	19,323	-62.3		12	19,376	-62.6		24	19,241	-56.4		28	19,315	-56.2		14	19,408	-67.0		8	19,192	-55.9		16	19,422	-65.5	
50	15	20,449	-61.0		11	20,506	-60.2		19	20,410	-56.7		24	20,479	-56.4		13	20,522	-61.3		7	20,332	-56.7		13	20,551	-61.9	
40	7	21,874	-57.5		10	21,901	-58.9		7	21,813	-57.4		21	21,902	-56.3		12	21,917	-57.7		6	21,743	-58.5		6	21,959	-58.1	
30					6	23,716	-56.2						14	23,716	-56.4		8	23,757	-53.9		5	23,576	-58.1					

Standard pressure surface (mb.)	CARIBOU, ME. (985 MB.)				CHARLESTON, S. C. (1015 MB.)				COLUMBIA, MO. (987 MB.)				DODGE CITY, KANS. (922 MB.)				EL PASO, TEX. (880 MB.)				ELY, NEV. (804 MB.)				GLASGOW, MONT. (941 MB.)			
SURFACE	31	191	- 5.2	71	31	13	11.3	76	31	238	4.6	57	31	792	4.2	51	31	1,195	14.6	24	31	1,908	0.8	53	31	648	- 4.5	72
1,000	31	73			31	137	13.3	59	31	127			31	117			31	91			31	112			31	162		
950	31	478	- 5.4	63	31	574	12.4	51	31	549	4.0	51	31	543			31	539			31	545			31	574		
900	31	900	- 7.5	60	31	1,020	9.9	51	31	984	1.6	56	31	986	4.2	46	31	1,002			31	992			31	997	- 5.1	65
850	31	1,342	- 9.8	62	31	1,493	7.5	47	31	1,442	- .2	55	31	1,449	2.4	47	31	1,482	13.1	24	31	1,455			31	1,444	- 7.3	60
800	31	1,808	-11.8	61	31	1,991	5.3	41	31	1,926	- 2.1	54	31	1,937	.9	44	31	1,988	9.4	27	31	1,949	1.8	45	31	1,914	- 9.1	57
750	31	2,307	-13.3	57	31	2,525	3.3	38	31	2,442	- 4.5	53	31	2,458	- .8	38	31	2,525	5.6	29	31	2,471	- 1.2	44	31	2,418	-10.5	54
700	31	2,823	-15.1	58	31	3,073	.8	37	31	2,977	- 7.3	46	31	3,002	- 3.3	36	31	3,079	1.7	33	31	3,012	- 5.7	49	31	2,941	-12.7	50
650	31	3,388	-17.9	57	31	3,672	- 2.4	31	30	3,559	-10.1	40	31	3,590	- 6.8	36	31	3,675	- 2.7	31	31	3,592	- 9.9	50	31	3,509	-15.6	48
600	31	3,975	-21.0	49	31	4,296	- 6.4	35	30	4,165	-14.0	36	31	4,205	-11.0	38	31	4,301	- 6.6	30	31	4,201	-13.9	51	31	4,103	-19.1	46
550	31	4,614	-25.0	46	31	4,979	-10.5	35	30	4,826	-17.9	33	31	4,867	-15.8	39	31	4,981	-11.0		31	4,856	-18.3	50	31	4,749	-23.3	46
500	30	5,291	-30.0	42	31	5,698	-15.0		30	5,526	-22.5		31	5,578	-21.0	37	31	5,701	-15.7		31	5,561	-23.0	45	30	5,432	-28.2	46
450	30	6,041	-35.2		31	6,497	-20.6	38	30	6,298	-28.2		31	6,354	-26.5	37	31	6,495	-21.1		31	6,327	-28.4	43	30	6,188	-33.5	46
400	29	6,852	-40.0		31	7,348	-26.4	42	30	7,126	-34.2		31	7,189	-32.2	36	31	7,348	-27.2	40	31	7,160	-34.3		30	6,996	-39.5	
350	29	7,752	-45.4		31	8,298	-33.4	39	30	8,047	-40.5		31	8,119	-38.4		31	8,295	-34.0		31	8,081	-40.9		29	7,902	-45.5	
300	29	8,767	-50.1		31	9,362	-41.3		30	9,081	-47.3		31	9,162	-45.2		31	9,356	-41.7		30	9,122	-47.6		29	8,914	-51.8	
250	29	9,949	-52.2		31	10,574	-50.4		30	10,268	-53.2		31	10,360	-51.4		29	10,565	-50.7		30	10,307	-53.5		29	10,082	-55.6	
200	29	11,393	-51.8		31	12,001	-57.8		29	11,690	-55.5		30	11,793	-54.7		21	11,992	-59.5		30	11,730	-56.1		29	11,508	-53.0	
175	29	12,258	-51.4		31	12,839	-59.4		29	12,541	-55.4		30	12,646	-55.5		17	12,795	-59.8		28	12,588	-56.0		29	12,372	-51.2	
150	27	13,241	-52.0		31	13,800	-60.7		29	13,520	-56.4		28	13,625	-55.3		14	13,758	-60.9		27	13,572	-55.5		29	13,373	-51.2	
125	26	14,418	-52.9		30	14,923	-63.6		28	14,672	-58.1		27	14,787	-57.7		10	14,891	-63.5		27	14,730	-57.1		29	14,556	-51.3	
100	26	15,850	-55.0		30	16,285	-65.9		27	16,073	-60.1		25	16,187	-59.2		7	16,248	-66.5		25	16,131	-59.0		29	16,000	-52.8	
80	25	17,271	-56.8		24	17,643	-65.8		24	17,461	-60.8		24	17,579	-60.8		5	17,581	-66.9		24	17,526	-59.9		27	17,436	-53.6	
60	22	19,075	-58.3		23	19,400	-63.2		23	19,241	-61.4		17	19,372	-60.6						18	19,331	-58.8		24	19,281	-54.2	
50	13	20,237	-59.7		21	20,521	-61.6		22	20,371	-61.4		13	20,508	-59.2						16	20,477	-58.7		17	20,447	-54.4	
40	7	21,650	-61.4		17	21,905	-59.1		16	21,755	-60.2		6	21,918	-58.9						9	21,894	-57.6		12	21,871	-55.2	
30	5	23,445	-61.1		7	23,750	-54.6		8	23,556	-58.7										5	23,703	-57.3		6	23,753	-55.5	

Standard pressure surface (mb.)	GRAND JUNCTION, COLO. (849 MB.)				GREAT FALLS, MONT. (886 MB.)				GREEN BAY, WIS. (989 MB.)				GREENSBORO, N. C. (983 MB.)				HATTERAS, N. C. (1016 MB.)				HILO, T. H. (1012 MB.)				INTERNAT. FALLS, MINN. (973 MB.)			
SURFACE	30	1,474	4.2	44	31	1,128	- 3.5	71	31	210	- 2.0	66	31	273	7.4	66	31	3	11.9	75	31	9	23.1	76	31	360	- 7.5	67
1,000	30	113			31	151			31	120			31	133			31	132	11.9	67	31	115	21.6	77	31	147		
950	30	544			31	572			31	534	- 2.6	55	31	557	9.0	54	31	562	9.8	56	31	561	17.9	81	31	551	- 6.2	58
900	30	995			31	1,003			31	955	- 5.6	57	31	1,003	6.5	56	31	1,007	7.1	49	31	1,019	14.6	84	31	970	- 8.9	57
850	30	1,462	4.7		31	1,450	- 4.7	60	31	1,401	- 8.5	55	31	1,469	3.2	56	31	1,475	4.4	48	31	1,501	11.7	84	31	1,411	-11.2	55
800	30	1,956	3.0	38	31	1,925	- 6.9	62	31	1,869	-10.4	56	31	1,958	1.1	49	31	1,966	2.3	44	31	2,007	9.5	78	31	1,874	-13.2	50
750	30	2,477	- 1.0	41	31	2,433	- 9.6	64	31	2,371	-11.8	51	31	2,481	- .5	41	31	2,490	- .1	37	31	2,546	6.8	67	31	2,373	-14.6	46
700	30	3,021	- 5.2	47	31	2,956	-12.7	64	31	2,891	-13.0	48	31	3,026	- 2.7	40	31	3,035	- 2.4		31	3,106	4.4	51	31	2,884	-17.1	45
650	30	3,603	- 9.7	51	31	3,524	-15.8	63	31	3,458	-14.8	44	31	3,616	- 5.8		31	3,626	- 5.4	31	31	3,709	2.0	39	31	3,448	-19.4	41
600	30	4,210	-13.7	51	31	4,117	-19.3	59	31	4,056	-17.9	44	31	4,232	- 9.6		31	4,244	- 8.8		31	4,348	- 1.8	36	31	4,029	-21.9	39
550	30	4,870	-18.2	49	31	4,760	-23.5	57	31	4,705	-22.0	43	31	4,903	-14.1		31	4,917	-13.1		31	5,036	- 5.6		30	4,667	-25.4	39
500	30	5,570	-23.0	45	30	5,451	-28.3	54	31	5,395	-26.6	43	31	5,615	-19.0	37	31	5,631	-18.0		31	5,776	-10.4		30	5,347	-29.5	38
450	30	6,340	-28.0	40	30	6,202	-33.8	50	31	6,153	-32.0	41	31	6,400	-24.2	37	31	6,420	-23.6		31	6,586	-15.7		30	6,097	-34.7	
400	30	7,170	-34.2		28	7,025	-39.3		31	6,969	-38.3		31	7,239	-30.0	41	31	7,261	-29.4		30	7,455	-22.3		30	6,903	-40.7	
350	29	8,099	-40.5		28	7,927	-45.7		31	7,872	-45.4		31	8,177	-36.4		31	8,200	-36.3		30	8,421	-29.7		30	7,799	-46.8	
300	29	9,131	-47.4		28	8,937	-52.3		30	8,879	-51.3		31	9,228	-43.8		31	9,252	-43.7		30	9,502	-37.3		30	8,805	-52.7	
250	29	10,317	-53.5		28	10,101	-56.8		30	10,053	-54.2		31	10,429	-51.4		31	10,453	-51.7		29	10,743	-45.9		30	9,975	-54.4	
200	29	11,737	-56.7		28	11,518	-54.6		30	11,486	-53.0		31	11,857	-56.9		31	11,878	-57.1		29	12,197	-55.2		30	11,409	-51.8	
175	29	12,584	-55.8		28	12,375	-53.3		30	12,348	-52.1		29	12,698	-57.4		31	12,721	-57.7		28	13,040	-60.2		29	12,277	-51.3	
150	29	13,566	-55.3		28	13,369	-52.4		29	13,345	-52.4		29	13,672	-57.2		30	13,691	-59.1		28	13,991	-64.8		29	13,278	-51.2	
125	29	14,724	-56.6		24	14,549	-53.1		29	14,519	-53.7		27	14,825	-60.0		28	14,819	-61.8		26	15,092	-70.0		29	14,460	-52.2	
100	28	16,130	-59.3		22	15,993	-55.0		29	15,946	-55.8		25	16,198	-62.2		26	16,190	-63.2		23	16,412	-74.1		29	15,899	-53.5	
80	27	17,523	-60.5		20	17,413	-55.8		28	17,363	-56.9		21	17,576	-61.7		24	17,557	-63.2		21	17,714	-74.6		26	17,335	-54.8	
60	22	19,325	-60.1		18	19,239	-56.5		24	19,181	-57.9		15	19,360	-59.0		19	19,324	-61.7		18	19,407	-68.1		23	19,177	-56.1	
50	19	20,466	-59.0		15	20,398	-55.8		16	20,332	-57.7		11	20,499	-58.2		19	20,457	-59.8		15	20,509	-64.9		21	20,329	-56.5	
40	15	21,877	-58.1		12	21,824	-55.9		8	21,774	-57.5		9	21,913	-57.7		14	21,868	-59.1		11	21,886	-60.8		13	21,731	-57.5	
30	6	23,684	-57.8		10	23,661	-56.3		6	23,598	-58.9						10	23,652	-57.8		5	23,693	-58.4					

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

MARCH 1954

Standard pressure surface (mb.)	LAKE CHARLES, LA. (1016 MB.)				LANDER, WYO. (824 MB.)				LAS VEGAS, NEV. (935 MB.)				LITTLE ROCK, ARK. (1006 MB.)				MAZATLAN, MEXICO (1010 MB.)				MEDFORD, ORE. (967 MB.)				MIAMI, FLA. (1017 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	5	14.1	72	31	1,696	- 3.0	70	31	660	12.6	30	31	79	11.1	55	22	14	21.4	79	31	401	8.1	66	31	4	20.0	75
1,000	31	141	14.2	67	31	133			31	90			31	130	9.6	50	22	102	20.9	73	31	118			31	152	19.9	73
950	31	574	11.8	62	31	554			31	531			31	565	10.4	49	22	561	23.2	25	31	549	9.2	51	31	593	17.0	72
900	30	1,025	10.5	53	31	992			31	982	12.6	29	31	1,007	7.7	51	22	1,017	21.9		31	991	6.2	50	31	1,052	15.0	61
850	30	1,501	10.2	40	31	1,449			31	1,458	8.8	33	31	1,476	5.5	49	22	1,510	19.1		31	1,456	2.5	56	31	1,534	13.5	51
800	30	2,004	8.9	37	31	1,931	- 2.3	57	31	1,956	4.7	35	31	1,970	3.3	47	22	2,027	15.9		31	1,943	- 1.3	61	31	2,043	11.7	38
750	30	2,541	6.9	36	31	2,446	- 5.0	55	31	2,487	1.1	36	31	2,498	1.1	43	22	2,583	12.9		31	2,455	- 4.8	63	31	2,584	9.5	35
700	30	3,101	4.2	34	31	2,980	- 8.0	54	31	3,029	- 3.0	40	31	3,044	- .9	36	22	3,148	9.4		31	2,994	- 8.0	57	31	3,149	6.4	34
650	30	3,702	.7		31	3,558	-11.8	54	31	3,618	- 7.0	42	31	3,637	- 3.9	36	22	3,765	5.4		31	3,570	-11.1	52	31	3,755	2.8	34
600	30	4,338	- 3.3	34	31	4,160	-15.4	50	31	4,232	-11.1	39	31	4,260	- 7.6		20	4,407	1.3		31	4,176	-14.9	51	31	4,396	- 1.0	32
550	30	5,022	- 8.0	36	31	4,817	-19.4	46	30	4,899	-15.7	38	31	4,936	-11.7		19	5,104	- 3.2		31	4,832	-19.2	51	31	5,085	- 5.2	33
500	30	5,753	-13.2	38	31	5,512	-24.3	45	30	5,608	-20.3	35	31	5,656	-16.7	37	19	5,848	- 8.4		31	5,531	-23.9	49	31	5,827	- 9.9	31
450	30	6,555	-18.4	35	31	6,281	-29.9	42	29	6,392	-26.0		31	6,445	-22.4	38	19	6,661	-13.5		30	6,295	-29.7	46	31	6,643	-15.2	31
400	30	7,416	-24.6	35	31	7,099	-36.2	41	29	7,228	-32.2		31	7,294	-28.0	39	16	7,547	-19.5		30	7,119	-35.5		31	7,513	-21.6	34
350	29	8,371	-31.7		31	8,012	-42.8		29	8,156	-38.8		31	8,239	-34.8		15	8,528	-27.1		30	8,034	-42.6		31	8,481	-28.7	36
300	29	9,442	-39.9		31	9,034	-50.0		28	9,193	-45.7		31	9,298	-42.1		14	9,623	-35.9		30	9,059	-48.9		31	9,564	-37.2	
250	28	10,658	-49.4		29	10,212	-55.6		28	10,387	-52.5		31	10,507	-50.9		12	10,879	-45.9		30	10,240	-54.4		30	10,796	-47.4	
200	27	12,097	-58.4		27	11,623	-56.1		26	11,781	-57.4		30	11,933	-57.0		10	12,326	-57.8		30	11,658	-56.5		30	12,232	-58.2	
175	26	12,931	-61.7		27	12,475	-54.3		24	12,619	-56.8		30	12,776	-58.2		6	13,155	-63.1		29	12,513	-55.1		30	13,063	-61.9	
150	26	13,880	-63.5		26	13,460	-53.1		23	13,586	-56.8		30	13,744	-58.9						29	13,501	-53.9		30	14,007	-65.3	
125	25	14,992	-66.3		24	14,630	-54.5		23	14,737	-58.2		30	14,882	-61.1						28	14,674	-55.5		28	15,110	-68.7	
100	21	16,331	-69.3		24	16,051	-56.7		21	16,126	-61.0		30	16,257	-63.6						26	16,095	-57.2		24	16,423	-72.2	
80	18	17,654	-69.7		23	17,462	-57.4		19	17,507	-62.7		24	17,618	-63.3						26	17,504	-57.8		21	17,741	-72.6	
60	17	19,381	-65.4		23	19,274	-58.1		14	19,291	-61.3		22	19,381	-62.5						16	19,315	-57.4		17	19,449	-66.8	
50	15	20,498	-61.7		21	20,416	-57.6		11	20,446	-59.9		14	20,505	-59.3						13	20,466	-56.9		16	20,563	-61.4	
40	14	21,897	-57.7		16	21,822	-58.1		10	21,845	-57.9		10	21,903	-58.1						12	21,883	-56.4		14	21,960	-57.4	
30	5	23,721	-55.6		8	23,665	-57.7		7	23,689	-55.9										6	23,714	-56.2		10	23,782	-54.2	

Standard pressure surface (mb.)	MIDLAND, TEX. (914 MB.)				NANTUCKET, MASS. (1010 MB.)				NASHVILLE, TENN. (995 MB.)				NORTH PLATTE, NEBR. (915 MB.)				OAKLAND, CALIF. (1015 MB.)				OKLAHOMA CITY, OKLA. (969 MB.)				OMAHA, NEBR. (981 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	871	13.6	26	31	14	3.0	76	31	177	8.9	67	31	849	0.1	67	31	6	11.3	71	31	391	8.5	52	31	300	1.7	63
1,000	31	99			31	94	3.6	67	31	133	3.3		31	120			31	131	10.7	69	31	125			31	138		
950	31	542			31	513	2.4	59	31	562	8.0	53	31	541			31	560	8.0	68	31	554	8.6	46	31	551	.7	58
900	31	998	14.6	24	31	945	.2	57	31	1,003	5.5	51	31	976	.6	59	31	1,001	6.2	57	31	998	7.2	44	31	985	- 1.4	59
850	31	1,479	12.3	24	31	1,401	- 2.2	57	31	1,468	3.1	50	31	1,433	- 1.3	59	31	1,467	3.2	55	31	1,466	5.9	39	31	1,439	- 3.2	57
800	31	1,984	9.2	24	31	1,881	- 4.6	54	31	1,957	.7	46	31	1,915	- 3.0	58	31	1,956	.6	51	31	1,960	4.0	32	31	1,917	- 4.2	54
750	31	2,518	6.9	23	31	2,391	- 6.8	48	31	2,478	- 1.3	39	31	2,432	- 5.0	57	31	2,475	- 2.0	43	31	2,489	1.2	31	31	2,430	- 6.1	52
700	31	3,079	3.0	24	31	2,923	- 8.6	43	31	3,021	- 4.0	41	31	2,964	- 7.7	53	31	3,016	- 5.3	41	31	3,033	- 2.0	32	31	2,962	- 8.7	51
650	31	3,675	- 1.1	27	31	3,502	-11.4	40	31	3,606	- 7.0	44	31	3,545	-10.8	53	31	3,599	- 8.6	39	31	3,624	- 5.8	35	31	3,541	-11.6	47
600	31	4,308	- 5.3	28	31	4,104	-14.8	37	31	4,222	-10.6	43	31	4,148	-14.4	54	31	4,211	-12.0	38	31	4,240	- 9.5	34	31	4,143	-15.0	47
550	31	4,987	-10.0		31	4,760	-19.1	36	31	4,891	-14.4	43	31	4,802	-18.7	52	31	4,874	-16.4	39	31	4,915	-13.6		31	4,798	-19.1	45
500	31	5,712	-15.3		31	5,460	-23.6		30	5,604	-18.8	46	31	5,505	-23.7	50	31	5,581	-21.5	39	31	5,625	-18.2		31	5,498	-24.1	46
450	30	6,508	-20.8	36	31	6,229	-29.0		30	6,387	-24.3	41	31	6,270	-29.7	50	31	6,354	-27.1	36	30	6,411	-23.7		31	6,267	-29.8	46
400	30	7,360	-26.6	40	31	7,054	-34.6		30	7,229	-30.1	38	31	7,094	-35.9	50	31	7,188	-33.0		30	7,251	-30.0		31	7,087	-35.9	45
350	30	8,312	-33.2	38	31	7,974	-41.0		30	8,166	-36.6		31	8,009	-42.4		31	8,113	-39.7		30	8,188	-36.4		31	8,001	-42.4	
300	30	9,377	-40.9		31	9,005	-47.5		30	9,218	-43.4		31	9,036	-48.7		31	9,150	-46.7		30	9,238	-43.7		31	9,028	-48.5	
250	29	10,593	-49.4		31	10,195	-52.2		30	10,422	-51.2		31	10,220	-53.5		31	10,338	-53.4		29	10,444	-51.2		31	10,211	-53.0	
200	28	12,023	-56.5		31	11,629	-54.2		30	11,854	-56.2		30	11,650	-54.2		31	11,758	-57.0		28	11,876	-56.1		29	11,641	-54.6	
175	28	12,865	-59.1		30	12,485	-54.0		30	12,700	-57.0		30	12,506	-53.9		30	12,601	-55.9		27	12,726	-57.4		29	12,496	-53.7	
150	28	13,825	-61.3		30	13,473	-54.1		29	13,671	-57.7		29	13,491	-53.9		30	13,582	-55.6		26	13,689	-58.6		29	13,484	-54.5	
125	25	14,936	-63.2		30	14,639	-55.4		29	14,815	-59.9		28	14,660	-54.7		29	14,741	-57.6		24	14,830	-60.9		28	14,649	-54.8	
100	23	16,300	-65.8		29	16,052	-57.2		26	16,183	-61.5		23	16,086	-57.3		27	16,138	-60.0		22	16,209	-63.7		27	16,066	-56.9	
80	20	17,653	-65.7		26	17,448	-58.2		23	17,558	-61.7		21	17,492	-58.3		27	17,529	-60.3		17	17,574	-63.3		27	17,475	-57.7	
60	13	19,418	-63.4		24	19,249	-58.9		19	19,345	-60.3		12	19,295	-58.7		25	19,323	-59.3		11	19,353	-61.6		22	19,289	-58.7	
50	8	20,549	-60.0		22	20,393	-58.8		16	20,492	-59.4		9	20,456	-58.0		19	20,457	-58.9		6	20,487	-59.4		21	20,434	-59.0	
40					16	21,803	-58.6		6	21,899	-56.9		6	21,883	-56.8		17	21,857	-58.1		5	21,881	-59.1		18	21,847	-58.0	
30																	13	23,666	-57.2						8	23,622	-58.8	

Standard pressure surface (mb.)	PHOENIX, ARIZ. (973 MB.)				PITTSBURGH, PA. (969 MB.)				PORTLAND, ME. (1008 MB.)				RAPID CITY, S. DAK. (903 MB.)				ST. CLOUD, MINN. (978 MB.)				SAN ANTONIO, TEX. (986 MB.)				SAN JUAN, P. R. (1015 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	338	16.3	42	31	382	2.4	63	31	20	- 0.5	70	31	966	- 3.5	74	31	316	- 4.3	70	31	243	17.0	45	31	19	23.7	79
1,000	31	109			31	120			31	87	- .5	60	31	146			31	141			31	124			31	150	23.2	78
950	31	552	17.2	28	31	538	1.9	60	31	499	- 2.1	61	31	559			31	549	- 4.1	64	31	564	16.0	47	31	600	20.3	78
900	31	1,006	13.9	28	31	971	- .5	62	31	924	- 4.5	63	31	992	- 6.0	68	31	972	- 6.2	59	31	1,020	13.6	48	31	1,062	17.4	74
850	31	1,484	10.1	29	31	1,426	- 2.9	63	31	1,373	- 6.0	63	31	1,444	- 3.5	62	31	1,417	- 8.2	55	31	1,499	11.6	44	31	1,548	14.4	69
800	31	1,984	6.2	31	31	1,904	- 4.7	55	31	1,846	- 7.4	60	31	1,922	- 5.1	60	31	1,886	- 9.7	52	31	2,004	10.1	36	31	2,059	11.7	60
750	31	2,515	2.3	33	31	2,417	- 6.4	52	31	2,351	- 9.5	57	31	2,430	- 7.6	56	31	2,387	-11.1	46	31	2,547	7.9	30	31	2,604	10.0	43
700	31	3,062	- 1.4	35	31	2,948	- 8.6	48	31	2,878	-11.7	51	31	2,960	-10.2	55	31	2,910	-13.4	45	31	3,105	5.6	24	31	3,169	8.4	26
650	31	3,656	- 5.0	34	31	3,529	-11.4	45	31	3,445	-14.7	46	31	3,535	-13.4	54	31	3,476	-16.3	45	31	3,711	1.6		31	3,787	6.0	
600	31	4,273	- 8.9		31	4,130	-14.8	43	31	4,044	-18.4	43	31	4,133	-16.8	56	31	4,069	-19.5	45	31	4,347	- 2.6		31	4,430	2.6	
550	31	4,945	-13.3		31	4,788	-18.9	41	31	4,690	-22.2	44	31	4,785	-21.0	52	31	4,712	-23.0	41	31	5,035	- 7.2		31	5,127	- 1.5	
500	30	5,660	-17.8		31	5,486	-23.8	41	30	5,383	-26.5	45	31	5,477	-25.8	50	31	5,403	-27.5	40	31	5,767	-12.3		31	5,881	- 6.2	
450	30	6,446	-22.9		31	6,257	-29.2	41	30	6,142	-31.6		31	6,238	-31.5	47	31	6,155	-33.0	41	30	6,567	-18.2		31	6,706	-12.3	
400	30	7,293	-28.9		31	7,079	-34.7	42	30	6,960	-37.2		31	7,055	-37.6		31	6,971	-38.9		30	7,433	-24.0	36	31	7,584	-19.1	
350	30	8,233	-35.7		31	7,999	-40.8		30	7,870	-43.0		31	7,962	-44.1		31	7,874	-45.7		29	8,397	-31.2	40	31	8,563	-26.9	
300	30	9,288	-43.2		31	9,033	-46.8		30	8,895	-48.7		31	8,980	-50.7		31	8,886	-51.9		29	9,470	-39.4		31	9,653	-35.8	
250	30	10,493	-50.9		31	10,225	-52.3		29	10,068	-51.6		31	10,153	-54.7		31	10,058	-54.8		29	10,691	-48.9		31	10,894	-45.4	
200	30	11,921	-56.8		31	11,656	-54.9		28	11,511	-52.2		30	11,580	-54.3		31	11,488	-53.6		29	12,124	-57.8		31	12,347	-55.6	
175	28	12,774	-59.3		31	12,510	-54.3		28	12,375	-51.6		29	12,439	-53.1		31	12,349	-52.1		29	12,959	-61.3		31	13,186	-61.2	
150	28	13,739	-59.4		30	13,487	-54.7		27	13,372	-52.6		29	13,433	-52.6		31	13,346	-52.2		29	13,910	-63.3		31	14,130	-66.5	
125	28	14,874	-61.6		28	14,650	-55.4		26	14,546	-53.6		29	14,606	-53.9		30	14,527	-53.3		28	15,018	-66.2		31	15,220	-71.5	
100	26	16,253	-64.6		24	16,058	-57.7		26	15,975	-55.2		29	16,034	-55.6		30	15,959	-55.0		23	16,361	-69.2		31	16,518	-77.0	
80	22	17,610	-65.1		24	17,462	-58.3		25	17,395	-57.0		29	17,450	-57.0		27	17,371	-56.0		16	17,685	-68.8		26	17,792	-78.4	
60	20	19,376	-63.2		22	19,266	-58.8		21	19,201	-57.6		23	19,270	-58.2		23	19,199	-56.7		11	19,426	-65.1		21	19,462	-69.9	
50	17	20,502	-61.6		20	20,416	-59.5		20	20,355	-58.1		19	20,420	-58.3		18	20,357	-57.5		7	20,546	-62.4		21	20,561	-64.7	
40	13	21,877	-59.3		14	21,798	-57.9		14	21,745	-58.1		12	21,825	-57.5		8	21,762	-58.9		6	21,942	-56.7		19	21,936	-60.5	
30	9	23,685	-56.8						6	23,646	-58.0														14	23,745	-56.5	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Standard pressure surface (mb.)	SANTA MARIA, CALIF. (1007 MB.)				S. STE. MARIE, MICH. (986 MB.)				SPOKANE, WASH. (930 MB.)				SWAN ISLAND, W. I. (1013 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	71	10.6	79	31	221	- 5.2	84	31	722	2.9	55	31	10	25.5	80
1,000--	31	133	10.7	77	31	110			31	126			31	126	25.4	77
950----	31	562	9.2	67	31	516	- 5.5	62	31	549			31	579	21.7	81
900----	31	1,007	7.5	57	31	934	- 8.7	64	31	987	2.7	48	31	1,044	18.8	76
850----	31	1,475	4.9	49	31	1,375	-11.1	66	31	1,446	- .7	49	31	1,533	16.2	63
800----	31	1,966	2.1	43	31	1,838	-13.0	61	31	1,927	- 4.2	53	31	2,047	13.9	55
750----	31	2,490	- .4	38	31	2,334	-14.3	58	31	2,434	- 7.9	57	31	2,598	11.8	37
700----	31	3,033	- 3.5	38	31	2,850	-15.9	55	31	2,965	-11.5	57	31	3,164	9.7	
650----	31	3,622	- 6.8	33	31	3,409	-17.9	52	31	3,533	-14.7	53	31	3,783	6.8	
600----	31	4,236	-10.5		31	4,000	-20.7	51	31	4,131	-18.1	51	31	4,429	3.1	
550----	31	4,900	-14.7		31	4,640	-24.3	49	31	4,777	-22.0	49	31	5,130	- 1.2	
500----	31	5,615	-19.6		30	5,330	-28.9	48	31	5,470	-26.7	48	31	5,881	- 6.1	
450----	31	6,395	-25.5		29	6,079	-33.9	46	31	6,225	-32.4	45	31	6,706	-11.6	
400----	31	7,232	-31.4		29	6,890	-39.5		31	7,041	-38.5		31	7,589	-18.1	
350----	31	8,164	-38.0		29	7,791	-45.5		31	7,946	-44.8		31	8,571	-25.8	
300----	31	9,208	-45.2		27	8,802	-50.9		31	8,961	-51.1		31	9,667	-34.7	
250----	31	10,403	-52.6		24	9,980	-53.4		31	10,133	-54.9		31	10,912	-44.6	
200----	31	11,826	-56.8		22	11,394	-51.7		31	11,562	-53.1		31	12,370	-55.1	
175----	30	12,668	-57.3		18	12,275	-51.5		31	12,424	-51.9		31	13,212	-60.5	
150----	30	13,642	-57.2		15	13,281	-51.3		31	13,424	-51.3		29	14,159	-65.5	
125----	29	14,792	-59.8		9	14,450	-52.9		30	14,606	-51.9		27	15,252	-71.0	
100----	28	16,180	-62.4						30	16,045	-53.6		23	16,557	-76.2	
80-----	28	17,554	-62.5						28	17,481	-53.5		20	17,840	-77.7	
60-----	25	19,330	-61.3						24	19,332	-53.6		18	19,506	-69.5	
50-----	22	20,468	-60.1						20	20,505	-54.1		17	20,608	-64.5	
40-----	19	21,862	-58.3						15	21,934	-54.0		17	21,986	-59.6	
30-----	13	23,676	-57.0						5	23,812	-53.7		17	23,801	-56.1	
20-----													13	26,393	-51.3	
15-----													7	28,265	-48.0	

Standard pressure surface (mb.)	TACUBAYA, MEXICO (772 MB.)				TAMPA, FLA. (1018 MB.)				TATOOSH ISLAND, WASH. (1012 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	26	2,306	19.5	38	31	9	15.8	79	31	31	6.0	71
1,000--	26	12			31	156	16.6	70	31	130	5.2	65
950----	26	481			31	595	15.3	59	31	551	3.0	60
900----	26	967			31	1,049	13.2	53	31	983	.1	59
850----	26	1,465			31	1,528	11.8	44	31	1,439	- 2.6	60
800----	26	2,004			31	2,034	10.6	37	31	1,917	- 5.3	55
750----	26	2,562	18.0	34	31	2,577	7.9	37	31	2,425	- 8.3	52
700----	26	3,143	13.8	35	31	3,135	4.7	39	31	2,953	-10.9	48
650----	26	3,768	8.3	42	31	3,741	1.4	33	31	3,527	-14.4	45
600----	26	4,417	2.8	51	31	4,375	- 2.1	31	31	4,121	-18.2	43
550----	26	5,117	- 2.7	55	30	5,063	- 6.3	31	31	4,767	-22.5	41
500----	26	5,863	- 7.7		30	5,799	-11.1	30	31	5,458	-27.1	38
450----	26	6,683	-13.0		30	6,609	-16.4	32	31	6,217	-32.3	
400----	26	7,564	-19.5		30	7,475	-22.7	31	31	7,031	-37.7	
350----	19	8,530	-27.2		30	8,440	-30.0	32	31	7,939	-44.0	
300----	12	9,617	-36.4		30	9,517	-38.4		31	8,957	-50.3	
250----	10	10,842	-46.8		30	10,744	-48.1		31	10,134	-54.5	
200----	5	12,298	-57.0		30	12,180	-57.9		31	11,561	-53.9	
175----					30	13,013	-61.4		31	12,422	-51.7	
150----					29	13,960	-63.8		31	13,423	-51.1	
125----					28	15,074	-67.0		31	14,605	-52.5	
100----					26	16,414	-70.3		31	16,043	-53.4	
80-----					23	17,732	-71.5		30	17,477	-53.0	
60-----					17	19,440	-67.1		28	19,332	-53.2	
50-----					13	20,552	-63.2		27	20,504	-53.6	
40-----					12	21,941	-57.5		20	21,933	-53.7	
30-----					9	23,776	-55.5		12	23,793	-54.1	
20-----									6	26,377	-54.1	
15-----												

Standard pressure surface (mb.)	VERACRUZ, MEXICO (1011 MB.)				WASHINGTON, D. C. (1005 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	29	13	23.2	80	31	88	5.7	56
1,000--	29	105	22.6	80	31	124	4.7	52
950----	29	550	21.6	68	31	549	4.3	56
900----	29	1,020	20.4	60	31	982	2.1	58
850----	29	1,513	18.0	55	31	1,442	.1	56
800----	29	2,029	15.4	49	31	1,926	- 2.0	53
750----	29	2,583	13.2	38	31	2,445	- 4.2	50
700----	29	3,152	10.5	30	31	2,979	- 6.6	47
650----	29	3,770	7.0	27	31	3,563	- 9.6	44
600----	28	4,418	2.2		31	4,169	-12.9	39
550----	28	5,114	- 2.4		31	4,831	-17.1	38
500----	27	5,863	- 7.5		31	5,534	-21.8	
450----	26	6,682	-13.0		31	6,312	-27.2	
400----	24	7,562	-19.5		31	7,140	-32.9	
350----	22	8,540	-27.1		31	8,067	-39.4	
300----	21	9,628	-35.9		31	9,107	-45.7	
250----	20	10,866	-45.9		31	10,302	-52.1	
200----	19	12,322	-56.0		31	11,731	-55.6	
175----	17	13,162	-61.4		31	12,580	-55.7	
150----	15	14,107	-65.6		31	13,559	-56.3	
125----	11	15,209	-70.1		31	14,712	-57.7	
100----	5	16,547	-76.4		30	16,105	-59.6	
80-----					22	17,499	-59.9	
60-----					17	19,288	-59.9	
50-----					16	20,420	-60.0	
40-----					14	21,815	-58.8	
30-----					6	23,638	-57.0	

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G C.T., "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Table 21

MARCH 1954

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
5urface----------	31	264	1.5	29	266	4.2	25	278	1.6	29	334	2.2	29	334	1.4	30	130	4.4
500--------------	--	---	----	--	---	----	--	---	----	--	---	----	--	---	----	29	147	4.3
1,000------------	30	233	2.1	--	---	----	--	---	----	27	288	3.0	29	327	1.5	22	182	4.4
1,500------------	28	246	4.3	--	---	----	25	267	3.6	23	311	3.3	29	294	2.0	19	235	3.4
2,000------------	26	254	6.4	29	261	4.7	24	281	6.4	21	304	5.5	27	271	2.6	15	246	5.1
2,500------------	23	263	8.8	29	265	5.2	21	290	7.8	19	296	9.0	24	282	3.6	13	244	6.8
3,000------------	22	262	12.0	29	276	7.4	17	285	9.2	17	301	9.9	21	288	4.3	13	254	8.3
4,000------------	21	267	16.2	23	284	13.7	12	292	8.2	15	299	12.8	19	303	7.1	13	251	10.3
5,000------------	17	266	19.2	19	284	16.7	11	299	11.3	14	303	17.7	17	302	9.2	11	255	9.7
6,000------------	15	267	23.0	13	297	20.2	11	297	13.7	10	310	14.5	14	304	12.0			
8,000------------				10	290	23.2							11	298	16.3			

Altitude (meters) m.s.l.	8uffalo, N. Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, 5. C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)			Ely, Nev. (1,910 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
5urface----------	27	243	5.2	29	281	1.2	30	235	3.6	31	263	2.7	27	263	2.6	30	230	2.1
500--------------	27	254	7.1	29	240	3.0	30	251	4.4	31	258	3.9	--	---	----	--	---	----
1,000------------	26	261	9.8	26	246	3.8	28	264	6.1	28	248	6.0	--	---	----	--	---	----
1,500------------	18	266	10.5	17	264	6.1	27	274	9.9	22	264	7.6	27	275	3.3	--	---	----
2,000------------	15	280	11.4	14	299	9.5	26	275	13.1	15	284	10.0	27	258	4.9	30	233	2.4
2,500------------				13	303	11.7	23	270	15.2	14	288	12.3	27	257	6.9	30	244	3.1
3,000------------				12	306	13.5	21	273	18.1	12	288	12.1	27	260	9.9	30	250	3.3
4,000------------				12	295	16.2	16	273	18.1	11	287	15.2	23	271	17.6	16	276	6.8
5,000------------				11	292	23.2	13	281	22.1				20	274	18.7	14	286	10.6
6,000------------							11	283	24.2				15	278	21.7	12	300	12.3
8,000------------																		

	Grand Junction, Colo. (1,475 m.)			Green Bay, Wis. (210 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Little Rock, Ark. (88 m.)		
5urface----------	31	269	1.7	29	298	3.1	28	266	3.5	28	344	1.1	30	253	1.4	30	218	1.3
500--------------	--	---	----	29	297	4.5	28	262	4.5	--	---	----	30	254	3.8	30	241	2.8
1,000------------	--	---	----	27	294	5.8	27	266	6.1	28	317	1.9	30	251	6.0	27	248	4.1
1,500------------	31	265	1.7	23	298	6.2	25	269	8.7	23	264	2.6	26	269	7.6	22	266	6.2
2,000------------	31	259	2.9	21	298	8.6	25	277	10.4	17	264	4.6	23	272	9.5	20	280	8.1
2,500------------	30	244	4.3	18	296	10.7	22	280	14.7	16	269	6.8	22	273	11.7	17	277	10.5
3,000------------	28	245	6.2	16	295	13.0	20	288	15.7	16	283	6.8	21	276	13.7	16	279	13.5
4,000------------	22	264	8.6	13	292	17.3	19	280	17.9	14	289	8.2	18	280	19.3	14	291	17.6
5,000------------	15	288	12.1	12	292	19.5	15	277	20.6	10	304	8.9	17	281	21.7	11	291	19.9
6,000------------	14	292	17.5	10	291	20.8	12	279	22.5				12	282	23.9			
8,000------------	10	277	20.6															
10,000-----------																		

	Medford, Ore. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			Oakland, Callf. (8 m.)			Omaha, Nebr. (306 m.)		
5urface----------	31	324	0.6	31	136	2.7	28	223	1.2	29	255	2.8	29	247	2.5	30	349	2.0
500--------------	31	319	.5	30	133	1.9	26	238	1.8	29	241	3.3	28	243	2.6	30	332	1.8
1,000------------	30	151	1.8	29	196	.9	21	277	4.1	25	256	4.8	24	215	2.3	26	255	2.5
1,500------------	30	205	2.7	27	268	2.9	16	299	5.2	20	261	5.2	22	227	2.5	21	259	4.7
2,000------------	28	219	2.9	24	278	5.1	15	283	7.6	20	278	6.9	22	261	3.5	17	270	7.9
2,500------------	25	235	1.5	22	273	6.6	10	292	11.5	19	289	9.2	18	289	3.2	17	276	10.0
3,000------------	24	269	2.0	21	283	7.6	10	276	14.3	18	290	13.0	16	288	3.5	16	284	13.0
4,000------------	20	313	5.3	20	275	9.9				17	282	16.4	15	294	6.9	14	296	15.1
5,000------------	18	317	7.5	19	283	13.0				10	282	18.5	12	287	11.3	13	298	18.7
6,000------------	14	339	10.2	18	274	16.0							11	280	9.9	12	300	21.6
8,000------------	12	345	10.2	13	271	20.0												
10,000-----------	10	326	15.8															

	Phoenix, Arix. (338 m.)			Rapid City, 5. Oak. (982 m.)			5t. Cloud, Minn. (318 m.)			5t. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)		
5urface----------	31	253	1.0	27	3	3.1	28	331	2.0	28	281	1.7	30	98	1.1
500--------------	31	249	1.7	--	---	----	28	328	2.3	28	261	2.8	30	101	1.5
1,000------------	31	239	2.5	27	3	3.1	27	307	3.1	25	265	3.7	29	193	1.2
1,500------------	31	239	2.6	27	315	2.7	22	306	6.3	22	265	5.8	25	246	3.1
2,000------------	28	243	3.1	22	308	5.3	20	308	7.5	20	276	8.9	22	261	5.6
2,500------------	27	246	4.2	21	296	7.7	19	310	8.8	18	279	11.7	22	261	8.8
3,000------------	23	260	4.7	20	296	9.4	16	302	10.7	14	285	12.6	22	258	11.3
4,000------------	22	265	9.5	14	300	11.7	14	295	14.4	12	290	16.3	19	256	14.9
5,000------------	17	273	13.3	12	299	16.0	11	304	14.5	10	288	17.3	18	258	20.0
6,000------------	12	272	14.8	11	296	19.7	10	315	14.7				10	275	21.7
8,000------------															
10,000-----------															
12,000-----------															
14,000-----------															
16,000-----------															

	San Oiego, Calif. (13 m.)			* 5ault 5te. Marie, Mich. (221 m.)			5pokane, Wash. (725 m.)			** Washington, O. C. (88 m.)		
5urface----------	29	270	3.3	30	305	4.2	29	236	1.3	31	260	3.1
500--------------	27	287	3.4	30	310	5.7	--	---	----	31	271	5.3
1,000------------	24	295	1.6	30	300	7.3	29	244	1.2	31	268	7.6
1,500------------	22	251	.5	30	300	8.6	29	235	2.8	31	269	11.1
2,000------------	20	297	1.3	30	300	9.3	26	251	3.1	31	270	13.7
2,500------------	20	296	3.9	30	295	10.9	24	255	3.1	31	276	16.2
3,000------------	20	284	6.2	30	291	12.6	21	266	3.6	31	277	18.3
4,000------------	19	277	9.9	30	288	14.5	19	295	7.1	30	273	22.0
5,000------------	18	282	13.2	30	285	17.7	14	311	11.0	30	269	24.6
6,000------------	16	268	14.9	29	282	21.7	12	307	14.9	28	269	28.8
8,000------------				29	282	27.1				28	267	37.5
10,000-----------				29	279	30.7				28	270	45.2
12,000-----------				27	280	27.8				27	271	50.6
14,000-----------				21	285	21.7				25	272	36.5
16,000-----------				16	288	16.0				24	269	29.4

* Rawin Data (cont'd)

18,000 m., 12 obs., 284 dir., 12.6 speed
20,000 m., 10 obs., 296 dir., 9.7 speed

** Rawin Oata (cont'd)

18,000 m., 23 obs., 278 dir., 19.2 speed
20,000 m., 20 obs., 272 dir., 14.7 speed
22,000 m., 14 obs., 268 dir., 13.0 speed

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, 5 = 180°, W = 270°); speeds in meters per second.

RAWIN DATA

Average monthly resultant winds

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrwood, La. (3 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	331	0.9	31	40	1.1	31	123	3.6	31	83	0.8
500	--	---	----	--	---	----	31	137	6.1	31	204	2.5
1,000	--	---	----	30	323	3.0	31	156	3.8	31	235	2.9
1,500	--	---	----	30	319	4.4	31	197	2.8	31	240	4.2
2,000	31	275	5.7	30	309	5.8	31	244	4.3	31	247	6.2
2,500	31	277	7.8	30	309	6.6	31	255	5.9	31	260	8.9
3,000	30	276	10.0	30	311	8.5	30	259	7.9	31	256	11.1
4,000	26	275	10.2	30	303	9.8	30	268	12.1	31	264	14.1
5,000	26	284	15.4	30	298	12.5	29	272	15.3	30	267	17.9
6,000	24	284	18.9	29	298	15.2	26	270	18.3	28	270	20.1
8,000	15	295	24.5	22	301	15.8	21	262	21.0	24	267	23.4
10,000				16	275	13.9	14	256	22.3	15	263	27.4
12,000				13	272	16.0						
14,000				12	270	11.3						
16,000				12	288	11.1						
18,000												
20,000												

Altitude (meters) m.s.l.	Caribou, Me. (191 m.)			Charleston, S. C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	280	3.3	31	216	2.1	31	31	0.9	30	38	0.8
500	30	303	5.4	29	247	6.2	31	243	.9	--	---	----
1,000	29	306	7.1	28	261	6.9	31	251	4.5	--	---	----
1,500	29	297	7.7	28	269	8.7	31	267	7.3	30	48	.5
2,000	29	296	7.5	29	274	11.0	30	279	9.6	30	227	2.5
2,500	28	294	10.1	27	275	11.1	30	274	12.0	30	237	5.5
3,000	28	280	11.3	27	275	13.6	30	281	14.2	30	245	7.4
4,000	28	273	13.8	25	277	18.0	30	279	14.7	30	267	9.5
5,000	27	270	14.6	20	275	19.3	30	282	18.3	29	281	12.4
6,000	26	258	16.6	16	270	22.0	30	282	22.1	26	290	17.1
8,000	16	254	17.2				29	279	32.7	18	281	16.8
10,000	11	277	15.2				29	274	40.3	11	292	15.2
12,000	10	269	16.6				28	276	39.1			
14,000							28	273	32.1			
16,000							26	273	20.5			
18,000							22	274	14.7			
20,000							16	288	8.1			

Altitude (meters) m.s.l.	Greensboro, N. C. (275 m.)			Hatteras, N. C. (3 m.)			Int. Falls, Minn. (358 m.)			Little Rock, Ark. (80 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	260	1.3	30	248	3.3	31	316	1.5	31	202	0.6
500	31	262	3.8	30	256	6.9	31	321	2.4	31	227	3.2
1,000	31	258	7.2	30	265	8.2	31	341	4.4	31	241	6.5
1,500	31	263	8.4	30	271	8.8	31	340	4.8	30	255	7.1
2,000	31	267	9.5	29	270	10.5	31	335	5.8	30	267	8.6
2,500	31	268	11.0	28	272	12.0	31	327	6.7	30	269	11.7
3,000	31	268	12.8	26	271	13.5	31	322	8.5	29	276	13.6
4,000	30	270	16.2	25	269	19.0	27	307	11.0	25	279	18.5
5,000	30	269	17.6	20	267	21.0	24	295	13.0	18	280	19.4
6,000	25	265	19.1	17	273	25.3	22	289	12.8	14	277	20.1
8,000	16	267	21.1				21	278	16.0			
10,000	10	264	26.4				14	279	15.7			
12,000							11	283	14.0			
14,000												
16,000												
18,000												
20,000												

Altitude (meters) m.s.l.	Medford, Ore. (401 m.)			Miami, Fla. (12 m.)			Midland, Tex. (871 m.)			Nantucket, Mass. (14 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	253	0.8	31	120	1.4	31	171	1.3	28	281	2.3
500	30	261	1.1	31	129	2.1	--	---	----	28	285	9.0
1,000	30	297	1.6	31	173	1.9	31	199	2.8	28	281	10.9
1,500	30	255	1.1	31	249	3.2	31	235	6.6	27	271	10.3
2,000	30	229	2.4	31	267	4.7	31	251	8.7	26	276	11.8
2,500	30	246	2.9	31	276	6.5	31	261	10.9	25	275	13.4
3,000	29	263	3.6	31	272	7.3	30	262	12.4	23	273	16.3
4,000	29	278	6.3	31	270	10.2	28	265	15.6	15	280	20.0
5,000	29	282	8.4	31	266	12.2	25	274	18.4	12	273	21.5
6,000	27	277	10.2	31	268	15.6	25	273	22.9	11	281	25.3
8,000	21	265	10.6	29	268	21.9	17	281	26.7			
10,000	17	287	11.6	27	270	26.6						
12,000	13	279	12.6	15	280	19.6						
14,000				12	291	21.7						
16,000												
18,000												
20,000												
22,000												
24,000												

Altitude (meters) m.s.l.	Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma, City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	228	1.2	31	261	2.7	31	82	1.1	30	349	2.7
500	29	241	4.1	31	242	2.8	31	119	1.1	--	---	----
1,000	29	247	7.4	31	223	2.8	31	218	3.6	28	355	2.1
1,500	28	265	7.1	31	212	3.2	30	247	6.7	28	319	3.4
2,000	27	279	8.9	31	234	3.2	30	258	9.9	28	311	4.7
2,500	27	281	10.6	31	246	4.3	29	265	11.3	28	300	6.4
3,000	28	276	12.8	31	254	5.0	28	268	13.4	29	301	7.4
4,000	26	272	16.9	30	276	6.4	27	277	14.9	28	287	10.8
5,000	20	280	20.2	30	283	8.4	21	281	18.3	28	285	13.7
6,000	18	268	22.9	29	279	9.7	19	284	19.7	28	285	15.9
8,000	10	275	23.5	25	278	12.9	14	279	24.8	22	293	15.7
10,000				18	304	15.3				16	277	17.1
12,000				11	270	17.0				11	275	17.0
14,000												
16,000												
18,000												
20,000												
22,000												
24,000												

Altitude (meters) m.s.l.	St. Cloud, Minn. (318 m.)			San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)			Santa Maria, Calif. (72 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	354	1.1	31	110	2.7	31	103	3.2	31	238	1.1
500	30	348	2.3	31	114	4.7	31	97	6.5	31	292	2.2
1,000	30	324	2.9	31	164	2.9	31	103	5.9	31	285	1.9
1,500	30	310	4.2	31	226	4.1	30	93	5.3	31	259	2.2
2,000	30	307	6.0	31	252	6.7	30	91	5.3	30	257	2.1
2,500	30	303	7.1	31	264	10.3	30	83	5.2	30	277	4.2
3,000	30	300	8.9	31	265	12.5	30	71	4.5	30	278	6.1
4,000	29	291	10.2	31	265	16.4	30	80	2.5	29	267	9.3
5,000	29	290	12.3	30	266	20.2	30	10	2.2	27	265	12.0
6,000	28	285	12.0	28	265	24.2	30	316	3.0	25	272	13.2
8,000	25	278	16.0	19	273	30.4	31	309	7.1	20	274	13.4
10,000	21	272	16.3	10	270	28.4	31	299	13.0	17	274	17.8
12,000	19	277	14.2				31	290	19.8	13	255	19.3
14,000	17	272	11.7				30	286	19.8	10	258	16.3
16,000	17	285	11.4				29	292	13.4			
18,000	12	304	7.2				21	312	4.3			
20,000	10	327	3.9				19	78	1.4			
22,000							13	117	4.2			
24,000							10	70	8.7			

Altitude (meters) m.s.l.	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is., Wash. (33 m.)			Washington, D. C. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	292	2.2	31	216	0.3	31	105	1.8	31	270	1.8
500	30	309	4.5	--	---	----	30	186	.9	29	270	6.6
1,000	30	323	6.7	31	236	1.4	30	200	1.6	29	271	10.4
1,500	30	318	7.5	30	246	1.8	30	207	2.0	29	271	11.2
2,000	30	313	8.4	30	249	2.4	31	248	2.3	29	271	11.9
2,500	30	306	8.1	30	267	3.1	31	263	3.1	31	273	13.5
3,000	30	295	9.3	30	272	3.8	30	275	4.3	31	272	14.2
4,000	30	291	12.8	27	294	5.7	28	288	3.3	31	266	18.3
5,000	29	282	15.9	25	285	6.6	25	308	5.4	31	266	22.7
6,000	28	279	19.9	23	271	6.5	25	303	6.9	31	269	26.5
8,000	28	280	24.9	21	263	7.4	15	272	9.8	31	269	36.4
10,000	22	273	24.9	17	310	5.6	13	293	11.5	31	269	45.2
12,000	16	281	21.8	16	310	7.2	10	295	10.4	29	267	47.0
14,000	11	284	18.6	16	312	7.2	10	313	7.9	28	273	36.2
16,000				15	308	5.5				27	275	25.4
18,000				13	344	3.3				19	275	16.6
20,000				12	26	7.3				16	271	14.6
22,000										13	258	6.8

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following Table 22 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun. MARCH 1954

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
TABLE MOUNTAIN, CALIF.									
	Air mass								
	3.76	3.01	2.26	1.51	*1.0	1.51	2.26	3.01	3.76
Mar. 4	----	----	----	1.41	----	----	----	----	----
6	----	----	----	1.38	----	----	----	----	----
26	----	----	----	1.40	----	----	----	----	----
27	1.06	1.16	1.27	1.41	----	----	----	----	----
Averages	1.06	1.16	1.27	1.40	----	----	----	----	----
Departures	-.07	-.06	-.06	-.06	----	----	----	----	----
ALBUQUERQUE, N. MEX.									
	Air mass								
	4.08	3.26	2.44	1.63	*1.0	1.63	2.44	3.26	4.08
Mar. 1	0.93	1.07	1.21	1.40	----	0.61	0.69	0.71	0.63
2	.95	1.09	1.20	1.35	----	----	----	----	----
5	.91	1.04	1.17	1.32	----	1.33	1.17	1.06	.95
6	.98	1.11	1.23	1.41	----	1.42	1.25	1.14	1.02
7	.93	1.05	1.20	1.37	----	1.27	1.18	1.04	.96
8	.81	1.01	1.15	1.33	----	1.36	----	----	----
11	.44	.46	.84	----	----	----	----	----	----
12	.74	.84	1.00	1.17	----	----	----	----	----
13	----	----	----	----	----	.83	.66	.53	.40
14	.44	.65	.82	1.05	----	1.02	.92	.77	.67
17	.54	.66	.80	.98	----	----	----	----	----
18	.99	1.10	1.18	----	----	----	----	----	----
25	----	----	----	----	----	----	----	.98	.88
26	.80	.90	1.05	----	----	----	----	1.02	.93
27	.99	1.07	1.18	1.34	1.52	1.33	1.20	1.09	.99
28	.95	1.04	1.16	1.33	1.54	----	----	----	----
30	.87	.96	1.10	1.25	1.48	.44	.39	.26	.24
31	.87	.95	1.08	1.22	1.26	1.22	1.07	.98	.87
Averages	.82	.94	1.09	1.27	1.45	1.08	.95	.87	.78
Departures	-.09	-.08	-.05	-.03	-.13	-.19	-.20	-.18	-.18
MADISON, WIS.									
	Air mass								
	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81
	NO DATA DURING MARCH 1954								

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
BLUE HILL, MASS.									
	Air mass								
	4.86	3.89	2.92	1.94	*1.0	1.94	2.92	3.89	4.86
Mar. 2	----	----	----	1.21	----	1.20	0.94	0.74	0.64
3	.83	.92	----	1.21	----	----	----	----	----
6	.79	.97	1.10	1.25	----	----	----	----	----
12	----	----	----	1.25	----	----	----	----	----
16	----	----	----	1.28	----	1.26	1.06	.94	.83
17	----	----	----	1.22	----	----	----	----	----
18	.90	1.01	1.17	----	----	1.33	----	1.05	.95
22	.83	.89	1.05	1.22	----	1.32	1.08	.93	.83
24	.67	.74	.86	----	----	----	----	----	----
27	.89	1.00	1.14	1.28	----	1.32	1.16	1.02	.92
Averages	.82	.92	1.06	1.24	----	1.29	1.06	.94	.83
Departures	-.06	-.05	-.03	-.01	----	.04	-.01	-.01	.01
LINCOLN, NEBR.									
	Air mass								
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77
Mar. 3	----	----	----	1.11	1.42	1.13	----	----	----
4	.37	.62	.87	1.09	1.40	----	----	----	----
5	----	----	----	1.04	1.41	1.11	.83	----	----
6	----	----	----	1.18	1.43	1.11	.84	.56	.31
8	.30	.51	.72	1.02	----	----	----	----	----
15	----	.43	.68	1.02	1.32	.98	.62	.39	----
26	----	----	.72	1.02	1.35	----	----	----	----
31	----	----	----	----	1.36	1.03	.79	.56	.41
Averages	(.34)	(.52)	.75	1.07	1.38	1.07	.77	.50	(.36)
Departures	(-.47)	(-.40)	-.32	-.19	-.09	-.15	-.27	-.40	(-.44)
BOSTON, MASS.									
	Air mass								
	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96
	NO DATA DURING MARCH 1954								

* Extrapolated

Langley is the unit used to denote one gram calorie per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

SOLAR RADIATION DATA

MARCH 1954

Table 31a Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	5	6	7	8	9	10	11		12	13	14	15	16	17	18		19	20	21	22	23	24	25	
Langleys	82	92	76	78	95	75	94	85	70	31	23	82	95	77	74	64	80	63	84	77	85	80	51	75
Date	26	27	28	29	30	31	1																	
Langleys	87	77	85	101	34	85	91	80																

Table 31b Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	5	6	7	8	9	10	11		12	13	14	15	16	17	18		19	20	21	22	23	24	25	
Langleys	280	315	269	243	216	152	145	232	307	29	25	89	344	266	333	199	246	55	220	328	110	317	51	190
Date	26	27	28	29	30	31	1																	
Langleys	299	346	331	247	28	91	80	203																

Table 31c Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	5	6	7	8	9	10	11		12	13	14	15	16	17	18		19	20	21	22	23	24	25	
Langleys	277	368	473	388	290	330	232	337	522	25	16	80	510	469	498	303	391	148	328	481	170	442	47	288
Date	26	27	28	29	30	31	1																	
Langleys	392	470	432	353	27	116	148	277																

Table 31d Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	5	6	7	8	9	10	11		12	13	14	15	16	17	18		19	20	21	22	23	24	25	
Langleys	142	144	266	270	168	209	218	202	307	34	22	92	333	316	314	203	225	217	220	350	169	300	51	219
Date	26	27	28	29	30	31	1																	
Langleys	329	352	290	279	37	138	233	237																

Table 31e Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	5	6	7	8	9	10	11		12	13	14	15	16	17	18		19	20	21	22	23	24	25	
Langleys	141	123	77	116	179	136	200	139	68	55	23	113	57	88	64	67	146	131	202	74	165	89	85	127
Date	26	27	28	29	30	31	1																	
Langleys	131	64	103	187	37	180	133	119																

Note: Langley is the unit used to denote one gram calorie per square centimeter.

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.

	Aklavik, MacKenzie	Albrook A.F. Base Balboa, C. Z.	Albuquerque, N.Mex.	Annette, Alaska	Astoria, Oreg.	Atlanta, Ga.	Barrow, Alaska	Betbel, Alaska	Bismark, N. Dak.	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Tex.	Canton Island, Pacific Area	Caribou, Me.	Charleston, S. C.	Columbia, Mo.	Columbus, Ohio	Davis, Calif.	Dodge City, Kans.	E. Lansing, Mich.	East Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Ely, Nev.	Fairbanks, Alaska	Fort Worth, Tex.	Fresno, Calif.	Grand Junction, Colo.	Great Falls, Mont.	Greensboro, N. C.	Griffin, Ga.	Hatteras, N. C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.
1954																																				
Mar. 5------	137	551	587	238	109	391	133	157	(424)	258	409	292	103	673	347	178	491	510	341	524	305	341	172	516	533	181	163	470	528	---	405	384	416	469	584	331
Mar. 6------	91	675	597	169	317	525	142	134	393	362	314	330	371	729	(275)	135	563	506	401	543	396	396	237	519	501	219	577	482	535	---	532	401	196	463	589	332
Mar. 7------	154	554	595	115	---	601	157	127	370	401	---	388	403	671	184	542	529	489	110	499	358	372	258	572	470	176	606	318	519	---	553	595	590	464	558	321
Mar. 8------	108	---	592	98	95	516	177	223	267	351	---	315	427	---	312	471	527	493	62	500	452	399	304	551	251	182	609	139	324	---	466	520	(526)	413	262	254
Mar. 9------	119	566	569	142	85	559	(179)	224	186	308	256	299	576	682	372	194	333	417	286	507	342	348	272	512	283	215	585	384	237	---	441	552	(186)	372	350	119
Mar. 10------	122	255	297	287	134	518	138	180	415	301	152	325	552	715	215	507	303	267	390	503	419	352	30	479	434	229	581	257	414	---	440	522	536	383	605	240
Mar. 11------	198	454	352	113	416	481	88	181	45	271	304	286	547	709	300	496	294	359	263	424	487	323	174	(285)	---	205	405	404	381	---	448	424	445	229	611	359
Averages------	133	509	513	166	193	513	(145)	175	(300)	322	287	319	426	697	(287)	360	434	434	265	500	394	362	207	(491)	412	201	504	351	420	---	470	486	(413)	399	509	279
Departures----	---	---	---	---	---	---	---	---	---	+27	---	+53	---	---	---	---	---	---	-78	---	+129	+69	---	---	---	+42	---	-47	---	---	---	---	---	---	---	+18
Mar. 12------	180	456	560	122	389	420	114	289	304	465	408	454	534	702	(371)	499	255	184	500	264	74	458	299	(538)	(460)	169	493	458	249	---	148	422	307	71	639	470
Mar. 13------	186	345	468	233	155	336	195	328	(470)	65	453	81	371	722	423	475	128	382	---	387	142	104	323	(517)	(558)	178	461	540	444	461	68	318	453	322	648	47
Mar. 14------	183	489	615	362	403	594	---	195	455	32	465	41	521	707	182	475	588	253	---	538	214	67	253	562	---	260	657	553	570	361	528	621	453	202	646	55
Mar. 15------	208	464	398	408	145	649	117	---	368	123	194	151	489	598	317	587	608	277	---	490	423	176	357	290	565	114	633	555	496	437	451	655	617	358	640	390
Mar. 16------	194	608	323	411	397	648	159	256	(426)	498	126	502	241	689	489	579	521	594	---	364	409	489	261	411	485	174	363	(78)	376	345	584	664	621	516	499	378
Mar. 17------	---	584	500	319	342	593	202	195	365	449	73	444	309	681	485	511	387	464	424	---	355	472	147	574	469	294	156	(392)	282	50	568	571	609	375	678	478
Mar. 18------	250	---	635	202	350	553	226	186	125	506	481	497	278	655	422	508	182	509	218	160	370	498	147	428	568	306	338	287	473	236	537	541	555	477	602	506
Averages------	200	491	500	294	312	542	169	241	(359)	306	314	310	392	679	(384)	519	381	381	---	367	284	323	255	(474)	(518)	214	443	(409)	413	315	412	542	516	332	622	332
Departures----	---	---	---	---	---	---	---	---	---	-1	---	+22	---	---	---	---	---	---	---	---	+54	+32	---	---	---	+13	---	-6	---	---	---	---	---	---	---	+82
Mar. 19------	207	464	534	414	156	121	(154)	168	318	430	220	390	503	686	497	94	115	104	361	---	27	441	176	499	---	140	457	(125)	306	444	78	84	296	135	579	242
Mar. 20------	145	372	367	435	---	506	198	179	---	179	261	193	418	---	131	472	84	105	247	102	191	133	(333)	519	269	108	517	483	290	119	456	500	482	103	527	122
Mar. 21------	169	532	376	384	430	651	234	395	74	337	460	338	450	680	201	533	585	647	284	388	451	230	432	580	349	201	512	472	343	---	560	656	415	543	480	193
Mar. 22------	251	559	248	411	---	558	187	290	435	513	512	495	565	586	303	610	263	414	406	295	210	504	183	274	281	291	328	602	196	536	563	597	658	231	227	547
Mar. 23------	219	680	332	456	309	226	210	216	488	232	---	268	374	642	395	201	234	230	472	49	355	310	115	425	419	257	341	(534)	357	283	237	378	243	234	530	53
Mar. 24------	291	665	387	364	---	136	210	372	105	480	388	466	512	697	557	412	207	296	400	358	99	457	(311)	382	314	306	129	250	258	255	202	226	232	144	665	494
Mar. 25------	305	467	518	225	335	601	(171)	394	506	104	532	99	365	---	518	557	570	193	393	598	214	146	298	667	469	342	664	557	307	509	409	605	464	238	644	41
Averages------	227	534	395	384	307	400	(195)	288	321	325	396	321	455	658	372	412	294	284	366	298	221	317	(264)	478	350	235	421	(432)	294	358	358	435	398	232	522	242
Departures----	---	---	---	---	---	---	---	---	---	-24	---	+36	---	---	---	---	---	---	-14	---	-41	-3	---	---	---	+3	---	-20	---	---	---	---	---	---	---	-50
Mar. 26------	161	547	579	481	74	422	250	422	428	438	170	---	399	689	175	306	654	347	523	595	87	478	401	656	(608)	342	410	595	537	218	462	274	259	369	706	186
Mar. 27------	293	484	680	478	352	97	259	423	284	545	56	529	281	670	---	126	604	558	558	584	352	553	387	677	(568)	354	576	603	634	365	126	67	204	386	697	564
Mar. 28------	273	691	602	467	471	237	159	398	562	515	252	486	552	710	532	176	552	265	524	592	262	540	341	633	---	385	684	534	537	592	310	198	196	368	618	216
Mar. 29------	198	614	484	481	---	361	158	428	578	426	241	383	562	712	235	485	39	179	147	347	86	420	493	532	---	354	(578)	224	571	460	513	320	572	40	688	17
Mar. 30------	305	506	660	335	---	459	162	373	579	56	561	64	560	691	427	528	212	242	280	319	447	133	(388)	457	---	368	334	527	480	628	449	482	502	427	732	420
Mar. 31------	177	461	700	500	284	384	184	436	565	201	281	283	538	712	520	401	630	505	547	635	444	235	430	683	(707)	360	443	641	666	355	72	326	191	402	718	418
Apr. 1------	196	652	699	501	233	659	200	---	296	190	436	217	105	---	559	500	688	643	547	638	483	239	447	685	(688)	325	697	604	652	446	642	641	166	598	725	482
Averages------	229	565	629	463	283	374	196	413	470	339	285	327	428	697	408	360	483	391	447	530	309	371	(412)	618	(643)	355	(532)	532	582	438	367	330	299	370	698	329
Departures----	---	---	---	---	---	---	---	---	---	-38	---	-13	---	---	---	---	---	---	-41	---	+34	+12	---	---	---	+61	---	+39	---	---	---	---	---	---	---	+27

Accumulated Departures January 1 to April 1, 1954

	Aklavik, MacKenzie	Albrook A.F. Base Balboa, C. Z.	Albuquerque, N.Mex.	Annette, Alaska	Astoria, Oreg.	Atlanta, Ga.	Barrow, Alaska	Betbel, Alaska	Bismark, N. Dak.	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Tex.	Canton Island, Pacific Area	Caribou, Me.	Charleston, S. C.	Columbia, Mo.	Columbus, Ohio	Davis, Calif.	Dodge City, Kans.	E. Lansing, Mich.	East Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Ely, Nev.	Fairbanks, Alaska	Fort Worth, Tex.	Fresno, Calif.	Grand Junction, Colo.	Great Falls, Mont.	Greensboro, N. C.	Griffin, Ga.	Hatteras, N. C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.
	---	---	---	---	---	---	---	---	---	-2534	---	---	---	---	---	---	---	---	---	---	+700	+910	---	---	---	+1148	---	+2338	---	---	---	---	---	---	---	-1232

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

SOLAR RADIATION DATA

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.-Continued

	Lake Charles, La.	Lander, Wyo.	Las, Vegas, Nev.	Lincoln, Nebr.	Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBCO)	Madison, Wis.	Medford, Ore.	Miami, Fla.	Midland, Tex.	Nashville, Tenn.	Newport, R. I.	New York, N. Y.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Phoenix, Ariz.	Prosser 4 NE, Wash.	Rapid City, S. Dak.	Riverside, Calif.	San Antonio, Tex.	Santa Maria, Calif.	S. Ste. Marie, Mich.	Sayville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle, Wash. (U. of Wash.)	Seattle, Wash. (WBAS)	State College, Pa.	Stillwater, Okla.	Swan Is., W. I.	Tampa, Fla.	Upton, N. Y.	Wake Island, Pacific Area	Washington, D. C. (Silver Hill Obs.)	Winnipeg, Manitoba
1954																																				
Mar. 5------	123	511	559	468	424	309	334	443	421	294	445	476	335	316	465	152	509	414	462	350	159	265	297	407	232	458	257	336	310	128	573	519	356	467	---	411
Mar. 6------	563	492	547	474	524	447	400	439	405	395	552	507	444	451	486	521	556	292	453	428	630	413	367	558	233	452	162	265	388	548	452	66	441	581	482	375
Mar. 7------	569	472	503	420	526	453	491	421	149	534	595	529	408	450	520	383	550	241	316	496	618	415	346	477	260	478	117	144	434	464	389	635	460	620	483	412
Mar. 8------	478	314	474	464	445	217	175	405	108	408	512	489	462	446	449	519	500	133	327	178	604	245	306	486	278	448	70	77	336	545	618	535	476	534	412	180
Mar. 9------	540	283	476	335	445	258	220	209	311	91	531	458	394	358	473	484	458	244	323	308	583	250	231	429	277	422	141	94	372	494	331	158	435	598	456	310
Mar. 10------	298	500	500	387	240	464	390	366	245	587	488	331	383	440	325	468	295	274	454	301	593	453	---	436	251	418	197	251	290	514	640	601	420	606	398	332
Mar. 11------	443	243	551	282	269	588	551	345	418	582	251	130	336	282	245	341	509	372	51	545	503	548	(469)	247	305	153	194	393	371	411	598	609	288	549	84	424
Averages------	431	402	516	404	410	391	366	375	294	413	482	417	395	392	423	410	482	281	341	372	527	370	(336)	420	262	404	162	223	357	443	514	446	411	565	386	349
Departures----	---	---	---	+82	---	---	---	+74	---	---	---	+108	+85	+106	---	---	---	---	---	-43	---	---	---	---	---	---	---	---	+70	---	---	---	---	---	---	---
Mar. 12------	267	274	579	34	343	615	544	35	415	479	541	242	502	372	178	490	618	468	(90)	611	596	585	(360)	412	62	166	323	420	411	399	626	575	431	---	106	451
Mar. 13------	241	534	558	410	223	634	578	218	466	353	422	178	72	37	96	---	604	423	470	614	473	593	---	55	287	54	114	171	45	402	542	493	58	604	41	---
Mar. 14------	557	529	575	500	578	653	572	343	(418)	482	583	446	57	148	350	582	597	461	431	611	599	588	354	139	413	238	394	464	185	588	650	431	149	605	404	420
Mar. 15------	582	552	567	508	558	604	542	497	281	556	352	568	280	291	510	402	338	295	508	598	646	586	---	341	223	399	173	251	386	548	585	621	372	560	353	456
Mar. 16------	349	513	569	394	520	251	199	490	274	616	487	578	543	547	553	322	606	260	473	481	310	120	501	561	451	527	282	347	510	397	603	656	552	638	528	312
Mar. 17------	372	405	542	436	450	615	438	288	342	518	570	516	504	534	514	455	195	327	416	302	149	566	---	554	427	520	333	449	515	473	---	582	539	481	481	215
Mar. 18------	144	302	566	82	198	463	504	237	409	412	516	543	558	546	494	360	572	517	29	556	329	533	268	565	454	525	445	570	513	419	608	533	563	641	535	327
Averages------	359	444	565	338	410	548	482	301	(372)	488	496	439	360	353	385	435	504	393	(345)	539	443	510	(371)	375	331	347	295	382	366	461	619	556	381	588	350	364
Departures----	---	---	---	-2	---	---	---	-14	---	---	---	+142	+38	+71	---	---	---	---	---	+125	---	---	---	---	---	---	---	---	+94	---	---	---	---	---	---	---
Mar. 19------	457	526	334	48	477	235	204	50	351	446	397	287	503	381	32	489	357	400	212	236	648	189	82	482	295	377	349	411	197	545	542	130	477	630	264	470
Mar. 20------	551	481	473	480	204	316	177	523	365	563	478	248	175	296	262	195	617	367	199	356	538	344	531	352	151	385	354	307	82	166	583	402	348	426	471	443
Mar. 21------	533	516	487	452	437	291	247	490	381	444	601	602	301	301	577	481	369	493	301	203	267	394	(541)	276	274	418	431	482	178	523	636	623	438	625	474	284
Mar. 22------	350	596	135	410	209	245	102	84	560	510	408	227	563	572	324	241	115	514	339	107	181	626	311	593	473	565	429	489	542	232	642	594	567	582	572	388
Mar. 23------	203	209	398	177	43	534	412	516	511	543	399	141	360	267	131	79	481	436	387	200	252	615	547	362	185	368	262	314	94	65	622	561	369	622	293	240
Mar. 24------	389	199	376	40	275	396	262	51	495	597	457	110	526	476	20	263	578	361	78	190	503	253	---	524	450	488	449	499	452	222	583	602	519	647	502	90
Mar. 25------	132	526	475	162	394	688	525	198	515	612	670	164	89	31	384	504	398	474	422	343	568	594	36	45	42	43	286	325	52	612	594	639	53	648	137	455
Averages------	374	436	382	253	291	386	276	273	454	531	487	254	360	332	247	322	417	435	277	234	423	431	(341)	376	267	378	366	404	228	338	600	507	396	597	387	339
Departures----	---	---	---	-127	---	---	---	-56	---	---	---	-86	-2	+5	---	---	---	---	---	-166	---	---	---	---	---	---	---	---	-73	---	---	---	---	---	---	---
Mar. 26------	307	493	636	517	381	743	598	497	463	567	455	496	466	486	505	215	643	384	401	651	485	641	(355)	464	368	377	158	133	366	285	380	614	474	538	327	486
Mar. 27------	157	484	649	512	529	660	578	177	202	474	673	384	579	466	59	558	675	537	205	643	565	639	(384)	476	488	---	116	117	530	594	694	581	471	608	246	545
Mar. 28------	453	322	569	83	545	447	430	136	233	562	636	607	561	485	494	576	510	476	456	458	542	254	(276)	542	307	555	522	549	279	646	669	519	524	609	558	528
Mar. 29------	381	284	665	153	393	413	261	214	393	613	361	302	451	456	304	25	494	562	501	203	552	199	(573)	499	99	508	515	576	395	216	689	[illegible]03	509	555	521	488
Mar. 30------	326	584	684	280	117	520	171	450	594	554	---	107	76	173	287	212	658	---	514	536	---	523	452	89	263	337	429	500	122	207	676	[illegible]9	83	619	459	566
Mar. 31------	347	612	668	525	265	674	607	330	591	613	---	63	236	394	61	546	690	---	603	652	---	656	(431)	465	435	90	237	300	456	592	704	617	398	600	40	470
Apr. 1------	594	471	684	545	658	611	608	458	390	611	683	664	342	532	625	594	690	329	331	658	---	665	297	456	496	455	277	157	587	648	625	583	395	546	497	475
Averages------	367	464	651	374	413	581	465	323	409	571	561	375	387	427	334	390	623	458	430	543	536	511	(395)	427	351	387	322	333	391	455	634	589	408	582	378	508
Departures----	---	---	---	-2	---	---	---	-28	---	---	---	-1	+3	+97	---	---	---	---	---	+108	---	---	---	---	---	---	---	---	+39	---	---	---	---	---	---	---

Accumulated Departures January 1 to April 1, 1954

	Lake Charles, La.	Lander, Wyo.	Las, Vegas, Nev.	Lincoln, Nebr.	Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBCO)	Madison, Wis.	Medford, Ore.	Miami, Fla.	Midland, Tex.	Nashville, Tenn.	Newport, R. I.	New York, N. Y.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Phoenix, Ariz.	Prosser 4 NE, Wash.	Rapid City, S. Dak.	Riverside, Calif.	San Antonio, Tex.	Santa Maria, Calif.	S. Ste. Marie, Mich.	Sayville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle, Wash. (U. of Wash.)	Seattle, Wash. (WBAS)	State College, Pa.	Stillwater, Okla.	Swan Is., W. I.	Tampa, Fla.	Upton, N. Y.	Wake Island, Pacific Area	Washington, D. C. (Silver Hill Obs.)	Winnipeg, Manitoba
	---	---	---	-14	---	---	---	-274	---	---	---	+4788	---	---	---	---	---	---	---	+2982	---	---	---	---	---	---	---	---	+546	---	---	---	---	---	---	---

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

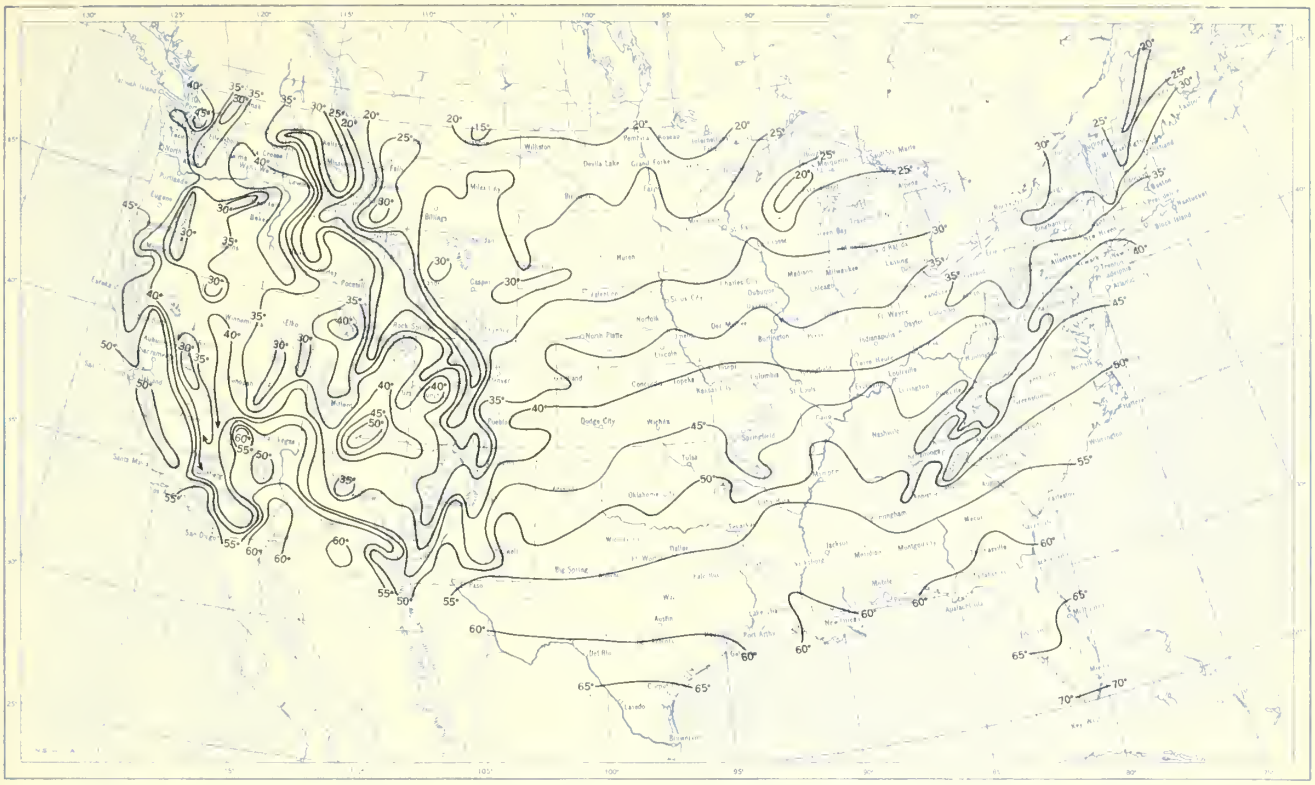
ILLUMINATION DATA

Table 34.-Daily illumination on a horizontal surface, tabulated in hundreds of foot-candle hours. MARCH 1954

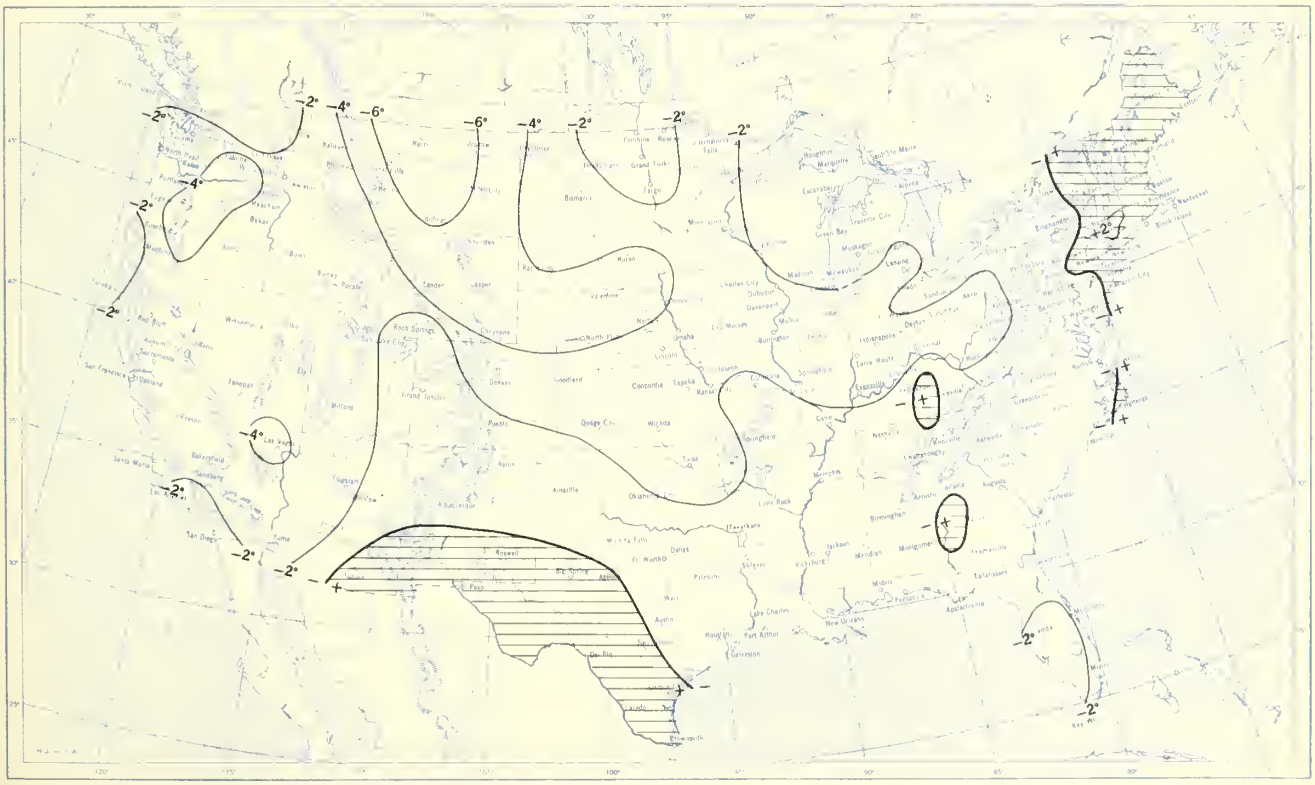
Station	Day of month																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average
Baltimore, Md.	58	496	96	356	496	514	524	462	486	434	94	159	56	278	470	561	538	579	316	504	472	600	---	520	68	316	290	614	580	520	48	384
Washington, D. C. (W8CO)	---	494	106	370	448	487	517	444	443	430	80	(110)	---	---	(363)	544	525	---	(285)	510	479	612	358	525	---	---	280	609	576	532	56	407

The foot-candle hour is the average illumination for one hour, in foot-candles. Foot-candle hours for a day are obtained by summing the foot-candle hours for the individual hours of that day. The illumination values are compiled from continuous records of the illumination output of a Foster Illuminometer. For a description of this instrument see "A Recording Daylight Illuminometer", by Normal B. Foster, in Illuminating Engineering, Vol. XLVI No. 2, pages 59 to 62.

Chart I. A. Average Temperature (°F.) at Surface, March 1954.

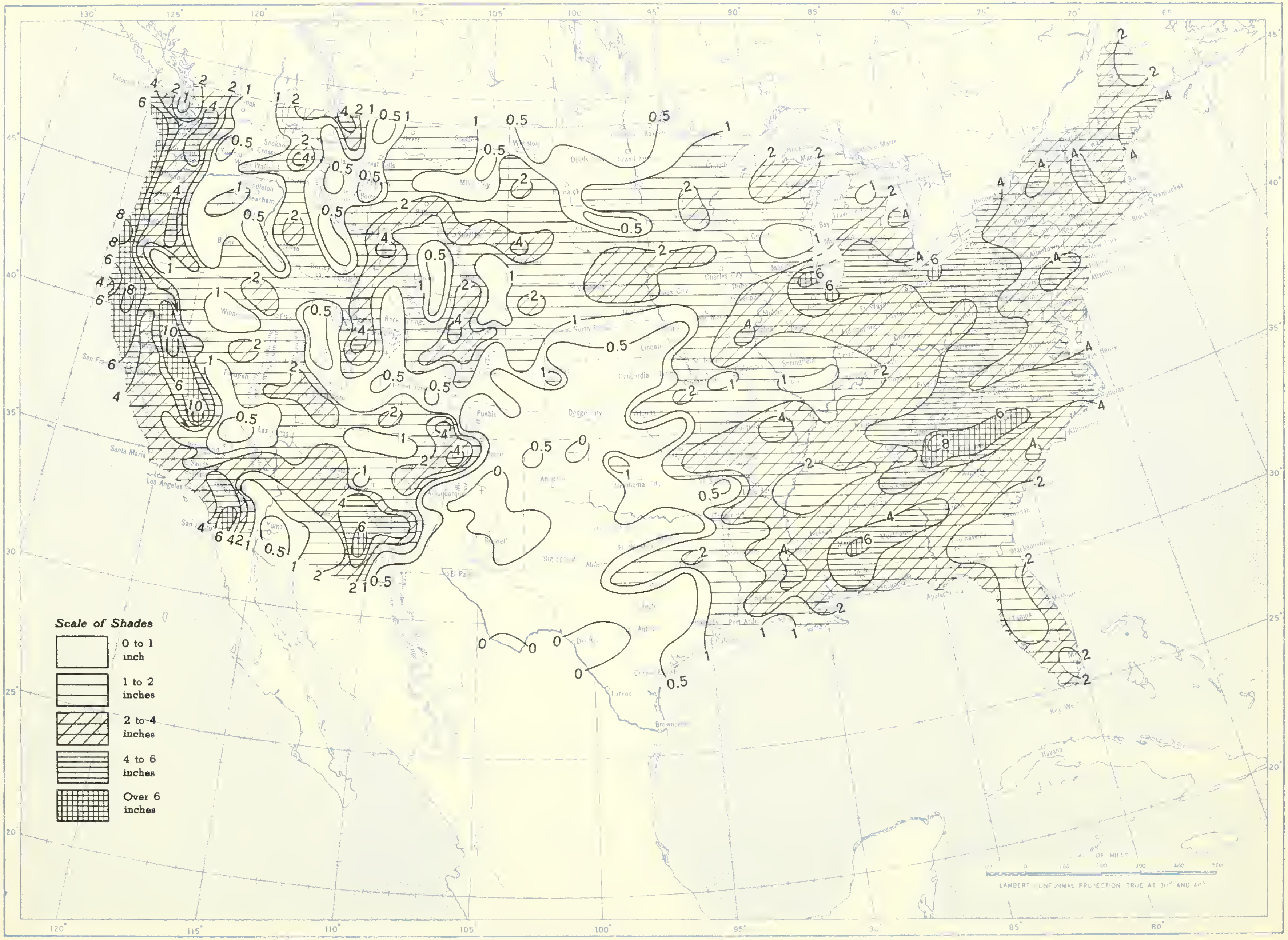


B. Departure of Average Temperature from Normal (°F.), March 1954.



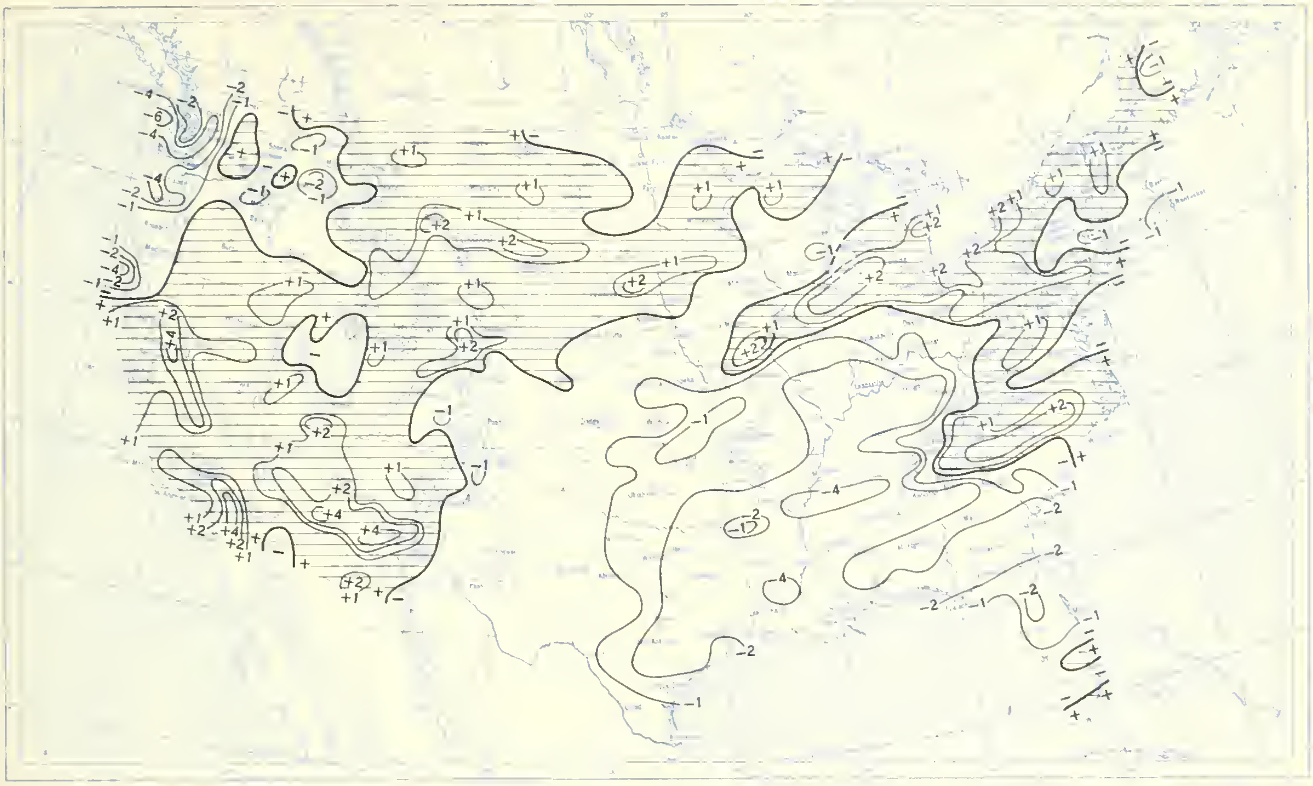
A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.
B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), March 1954.

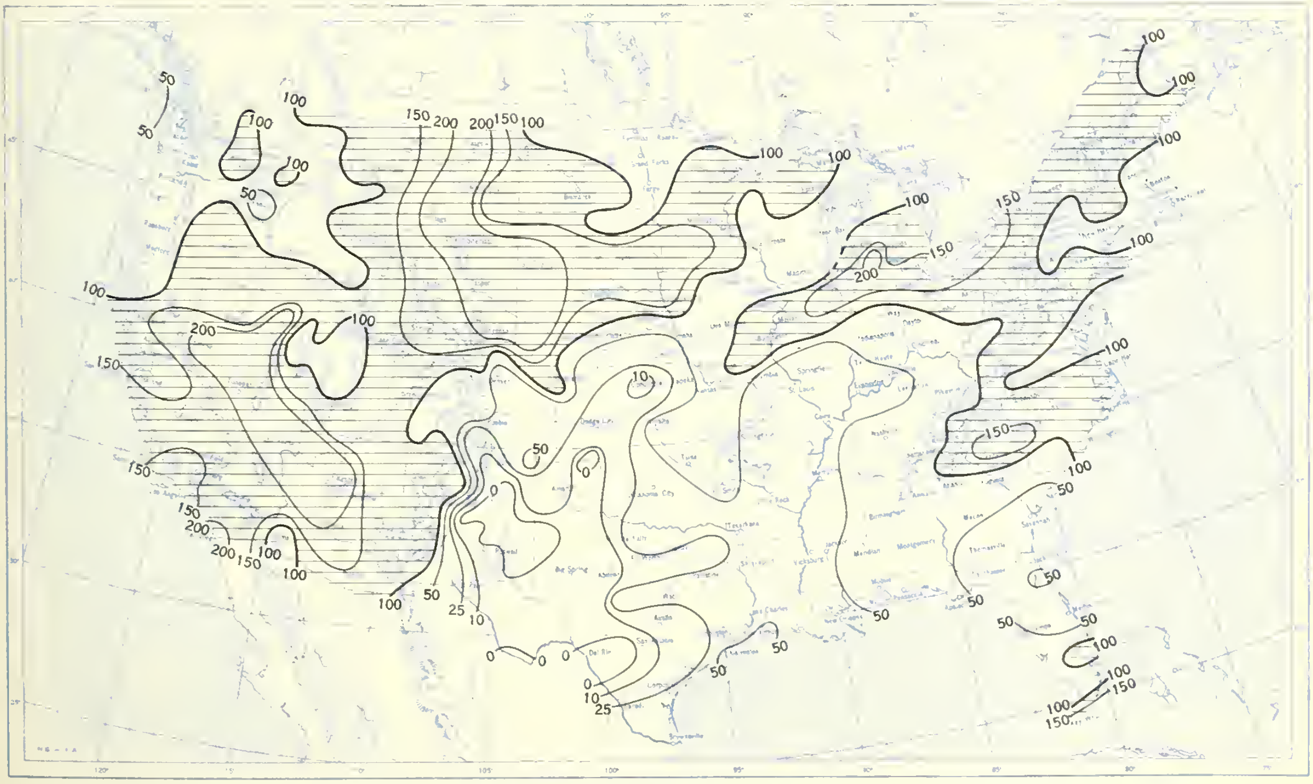


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), March 1954.

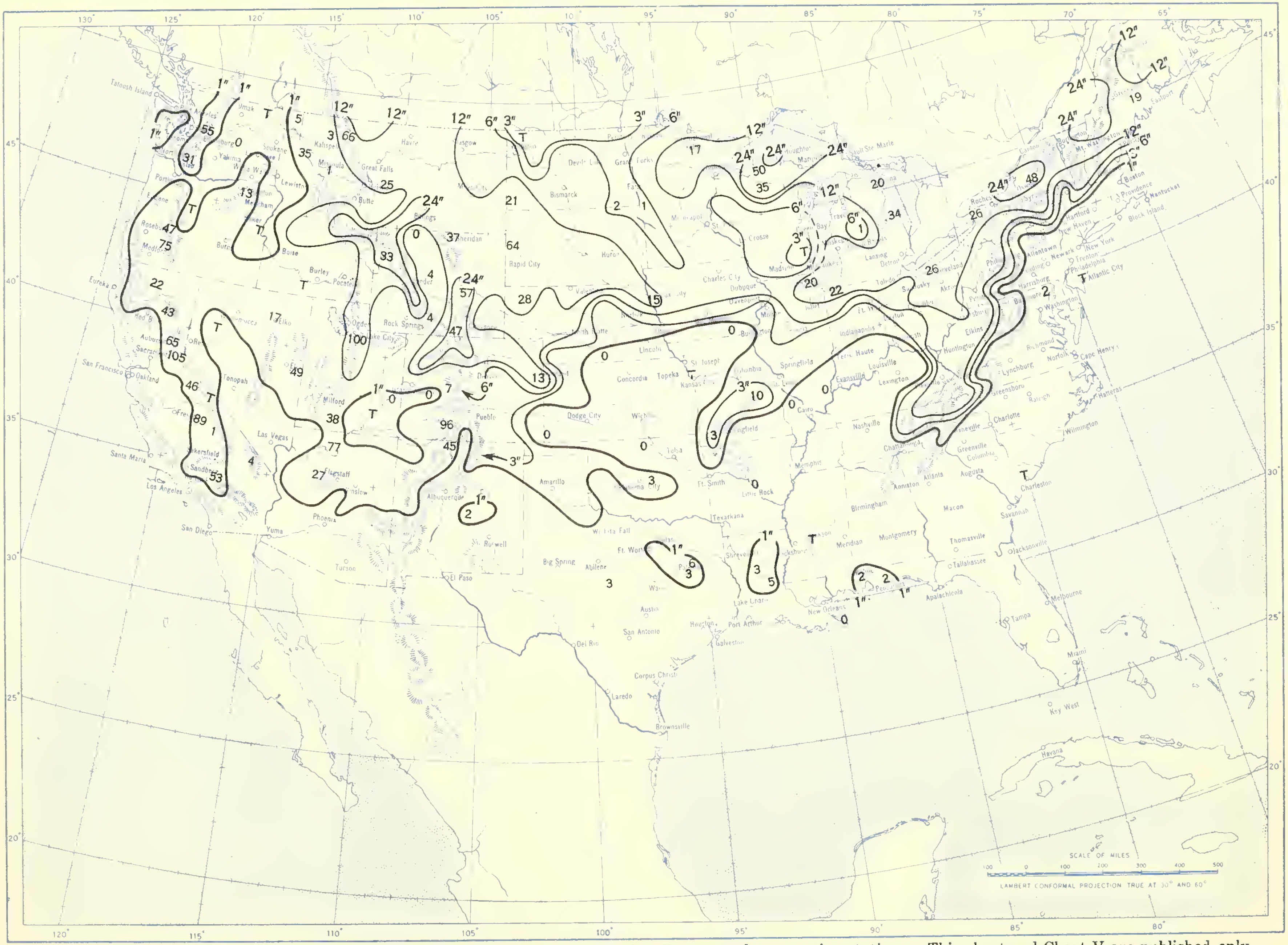


B. Percentage of Normal Precipitation, March 1954.



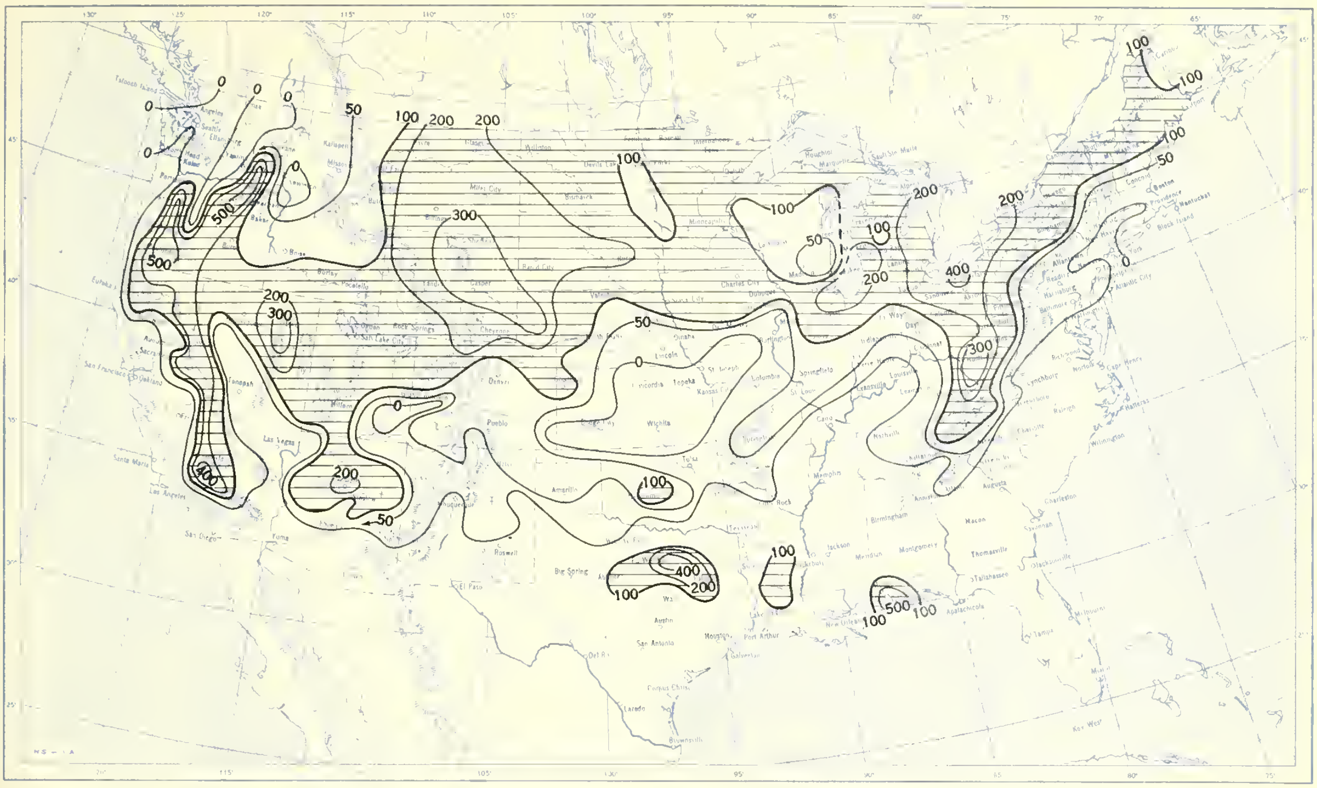
Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart IV. Total Snowfall (Inches), March 1954.

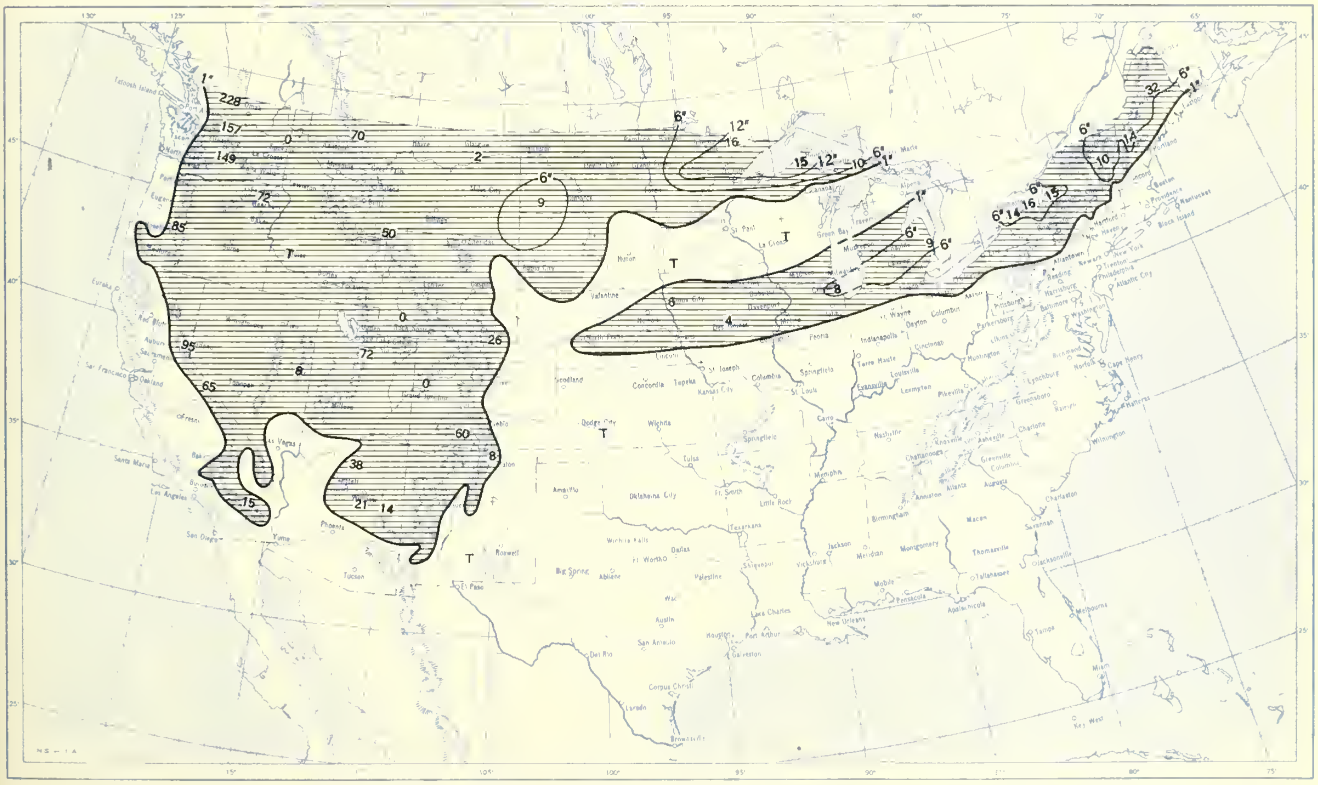


This is the total of unmelted snowfall recorded during the month at Weather Bureau and cooperative stations. This chart and Chart V are published only for the months of November through April although of course there is some snow at higher elevations, particularly in the far West, earlier and later in the year.

Chart V. A. Percentage of Normal Snowfall, March 1954.

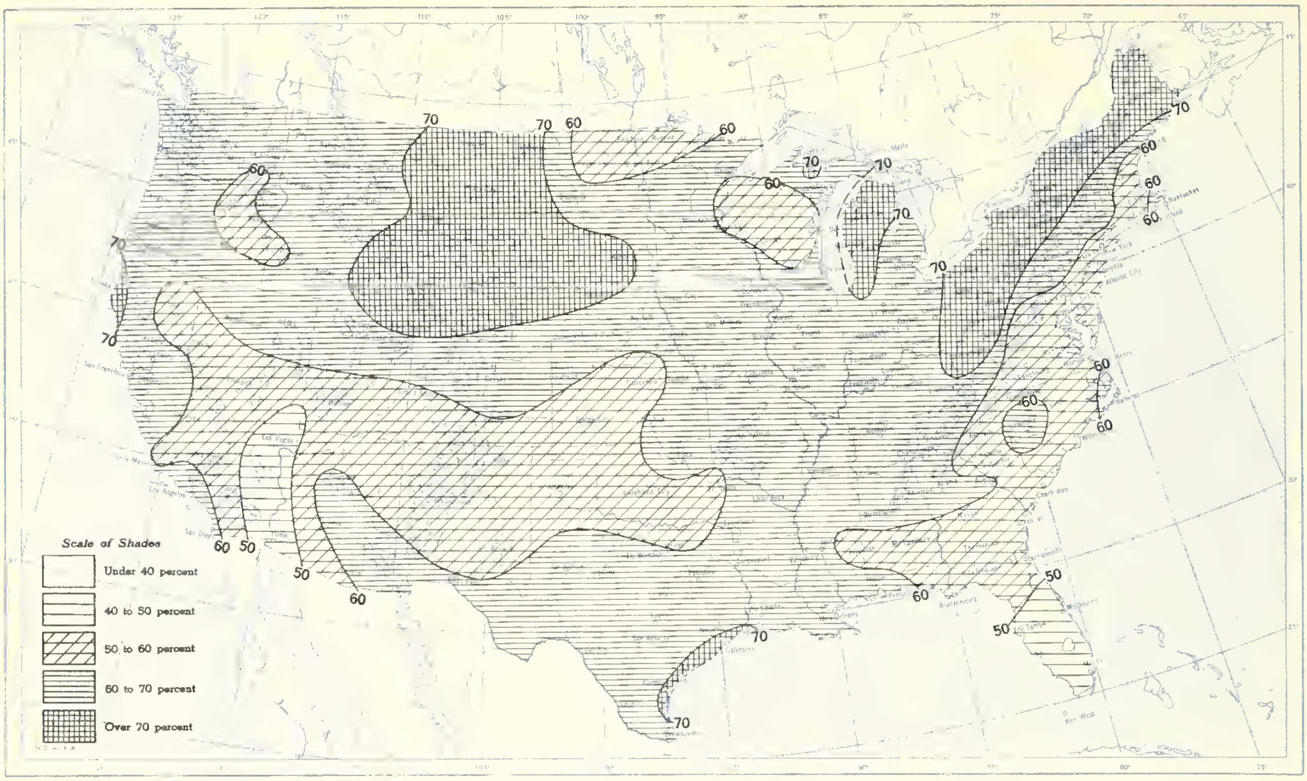


B. Depth of Snow on Ground (Inches), 7:30 a. m. E. S. T., March 30, 1954.

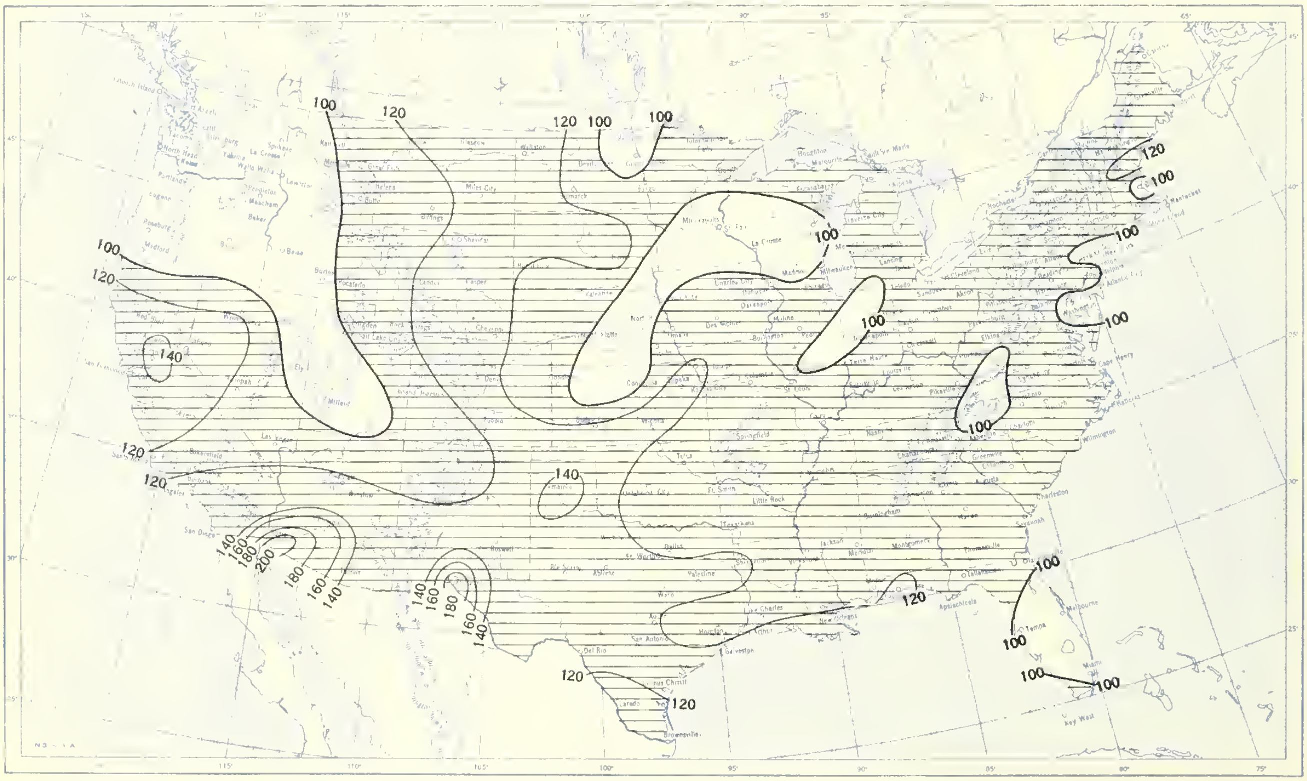


A. Amount of normal monthly snowfall is computed for Weather Bureau stations having at least 10 years of record. B. Shows depth currently on ground at 7:30 a.m. E.S.T., of the Tuesday nearest the end of the month. It is based on reports from Weather Bureau and cooperative stations. Dashed line shows greatest southern extent of snowcover during month.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, March 1954.

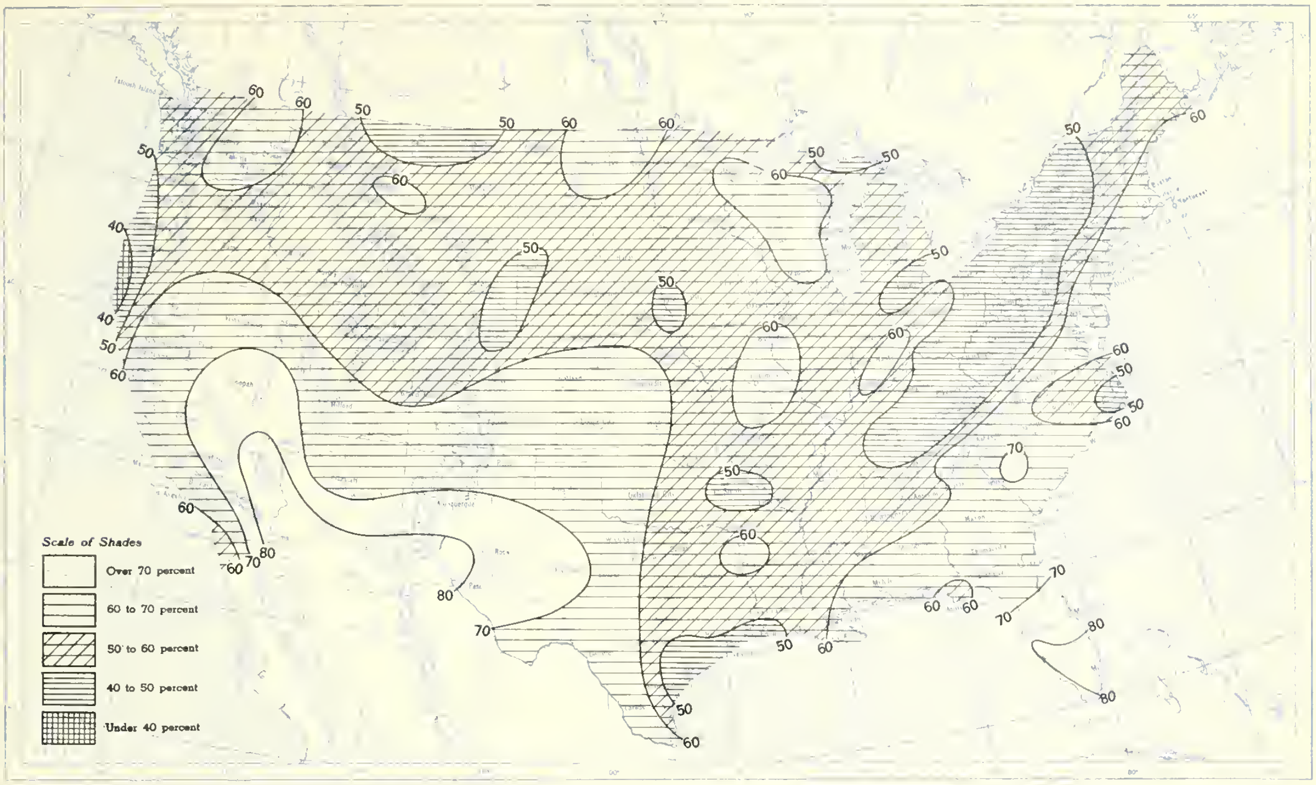


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, March 1954.

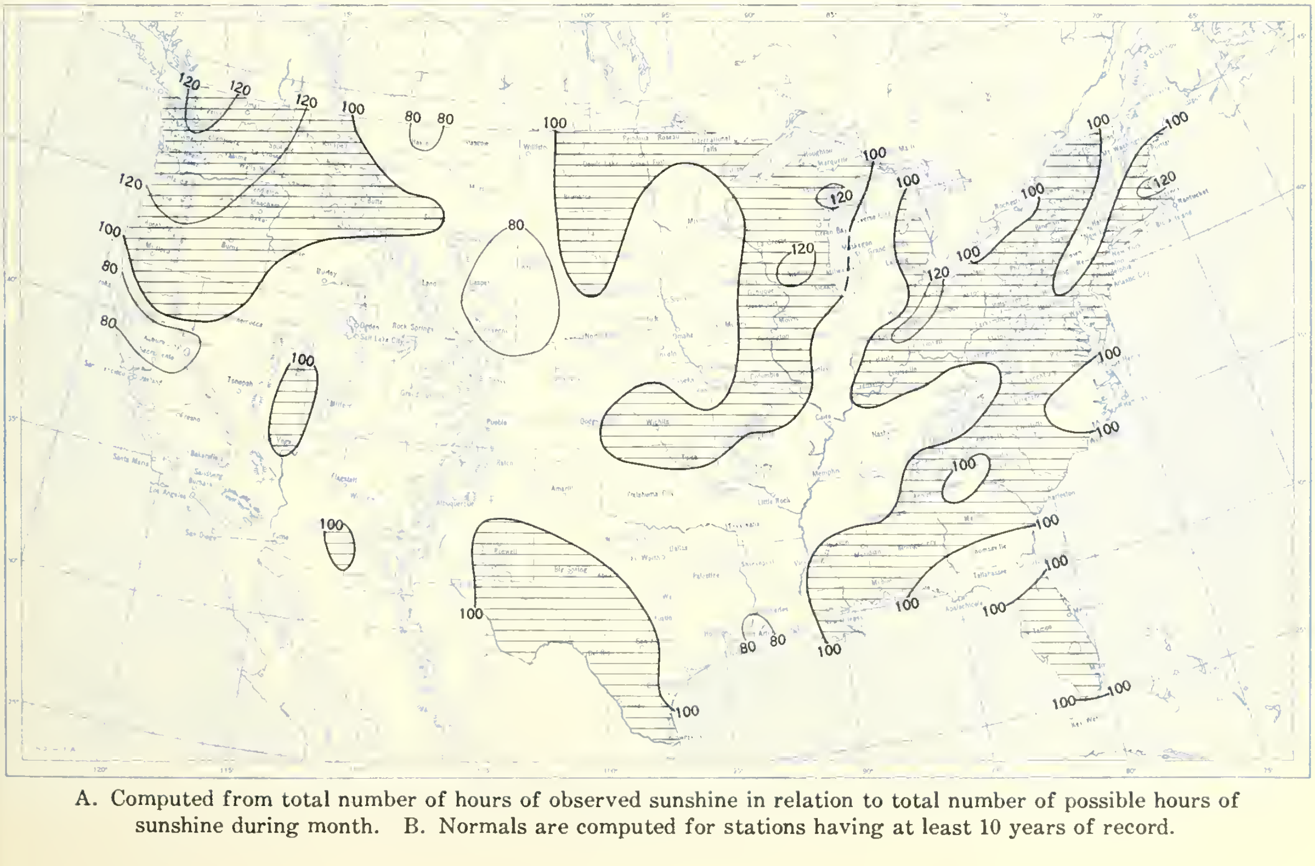


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, March 1954.



B. Percentage of Normal Sunshine, March 1954.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, March 1954. Inset: Percentage of Normal Average Daily Solar Radiation, March 1954.

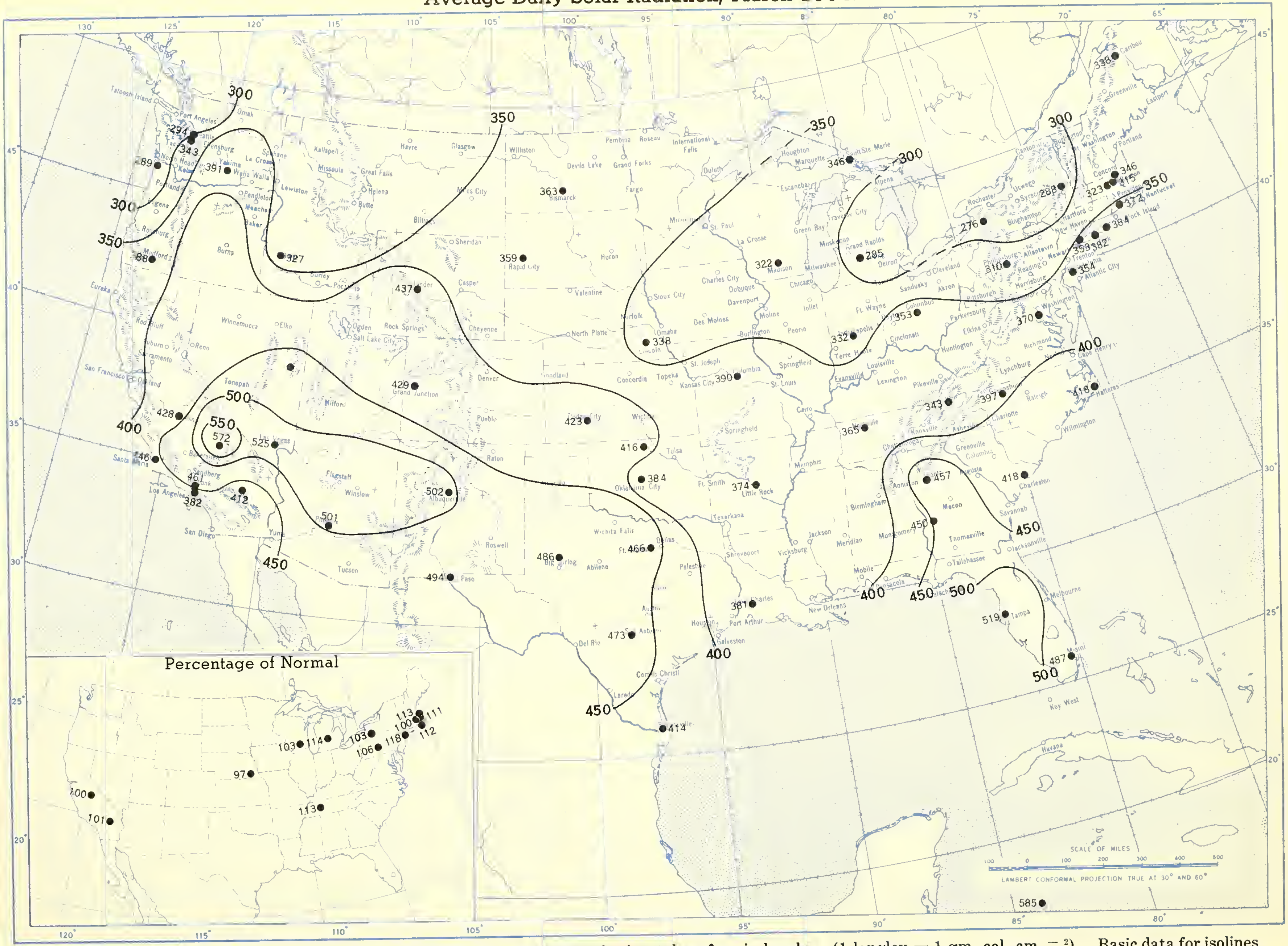
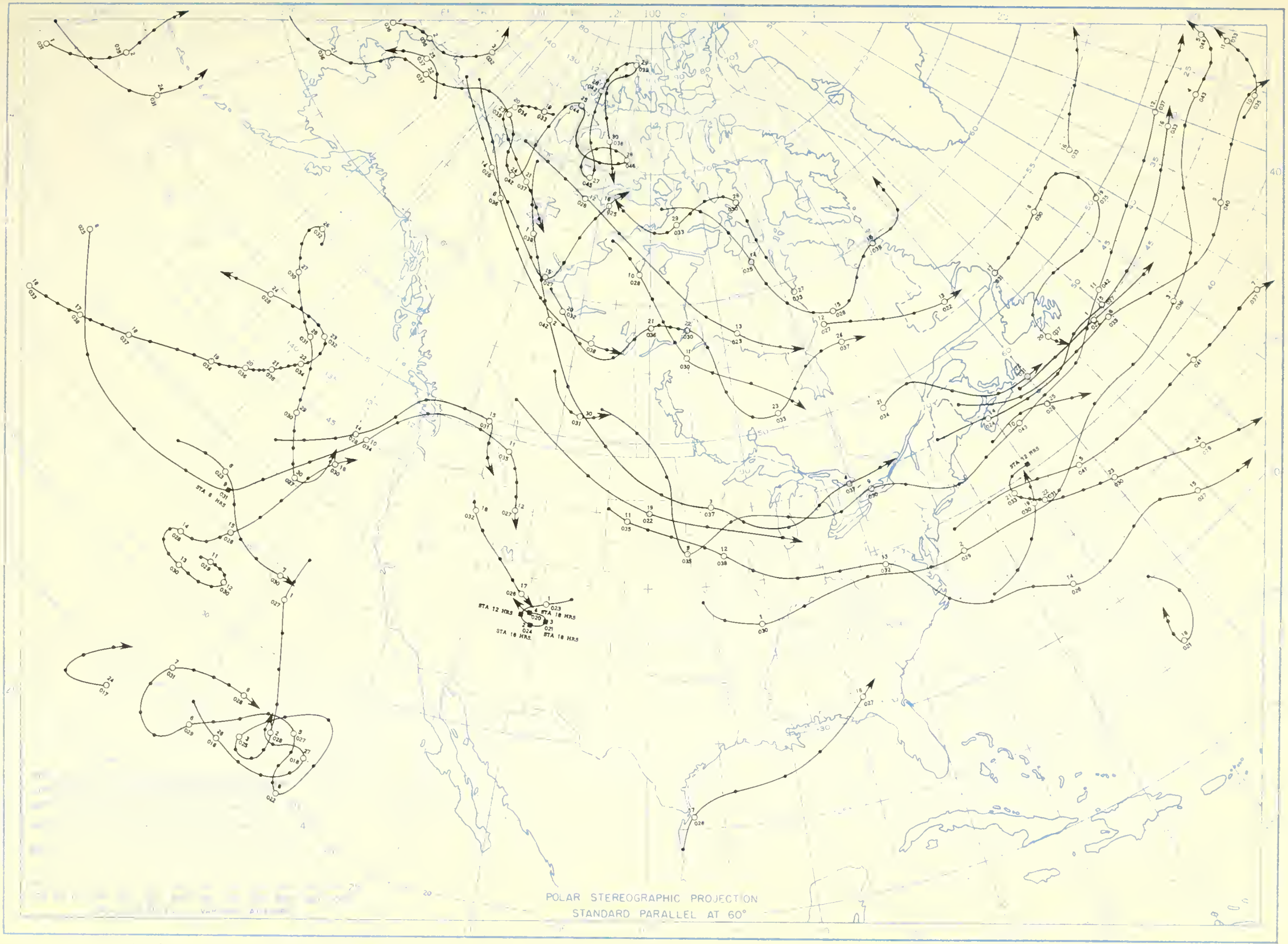


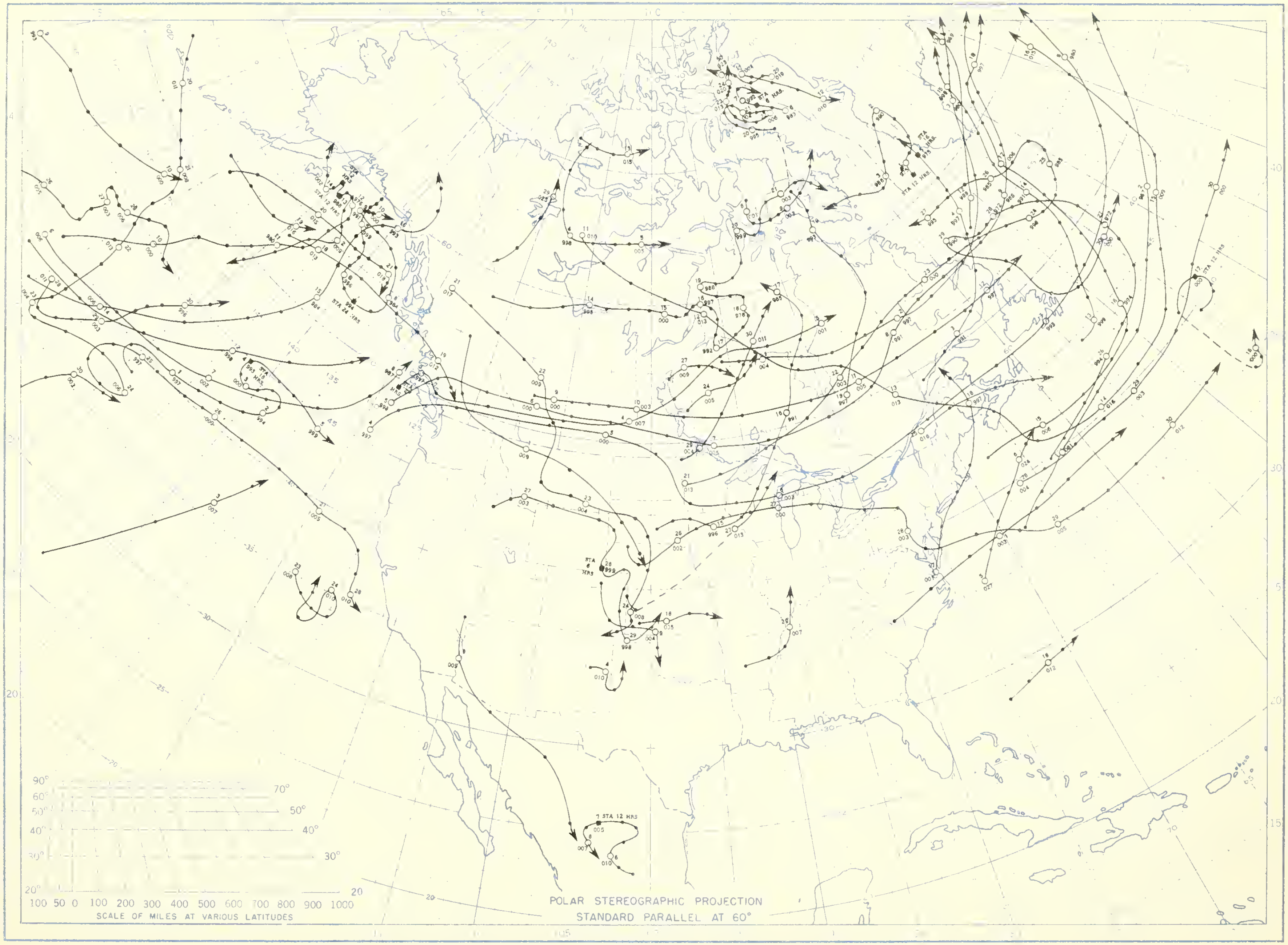
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm. $^{-2}$). Basic data for isolines are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals

Chart IX. Tracks of Centers of Anticyclones at Sea Level, March 1954.



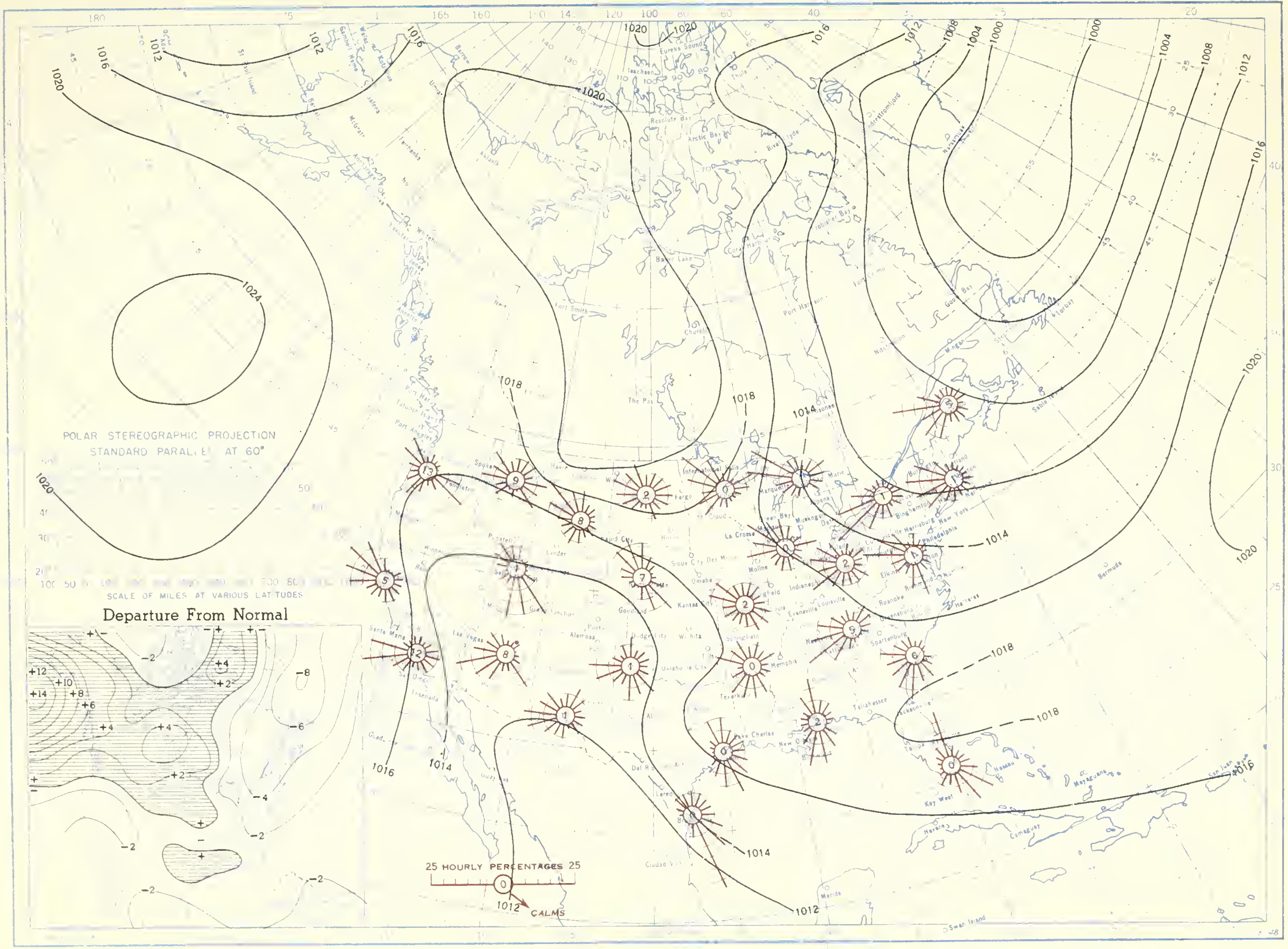
Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

Chart X. Tracks of Centers of Cyclones at Sea Level, March 1954.



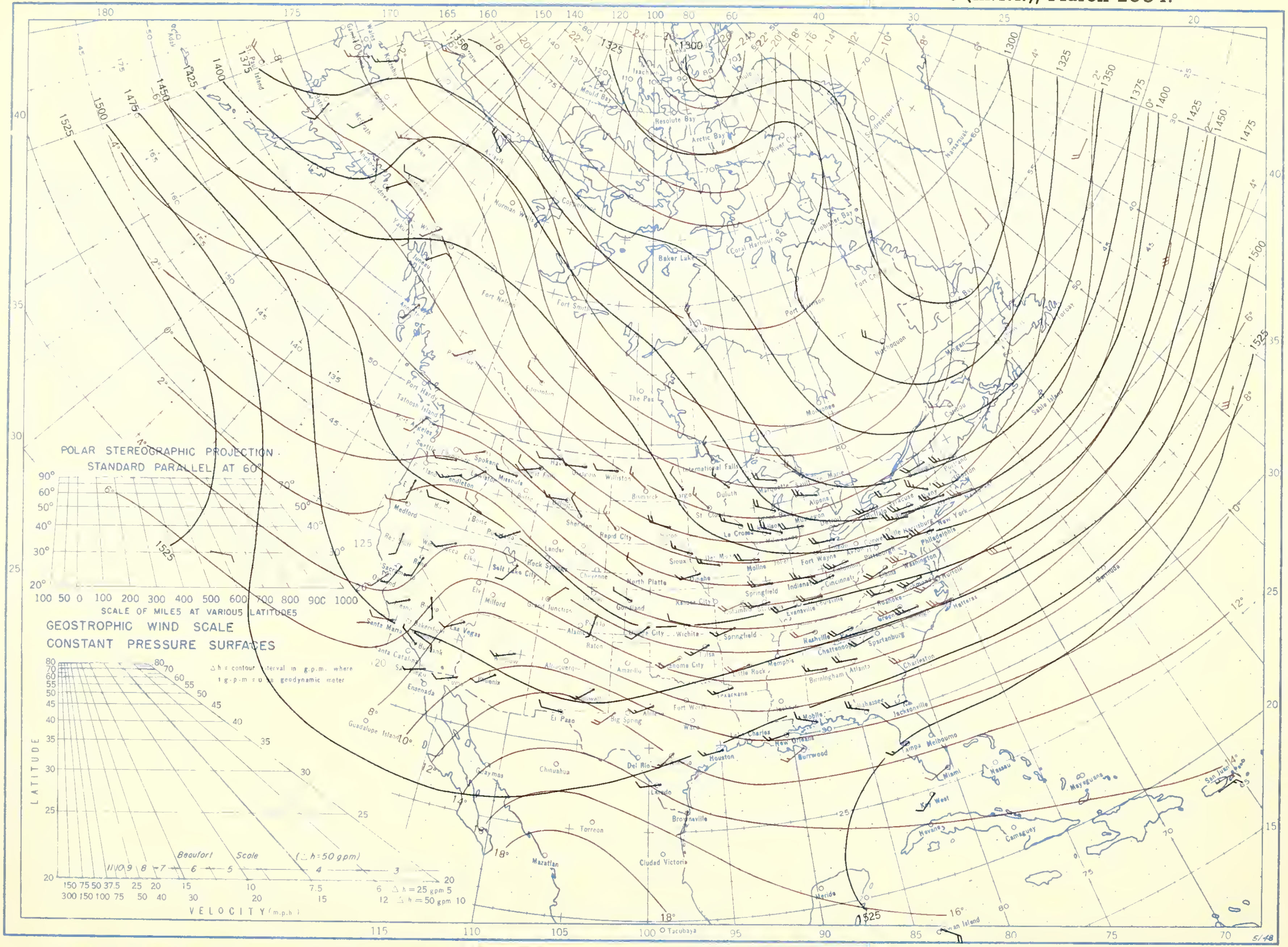
Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, March 1954. Inset: Departure of Average Pressure (mb.) from Normal, March 1954.



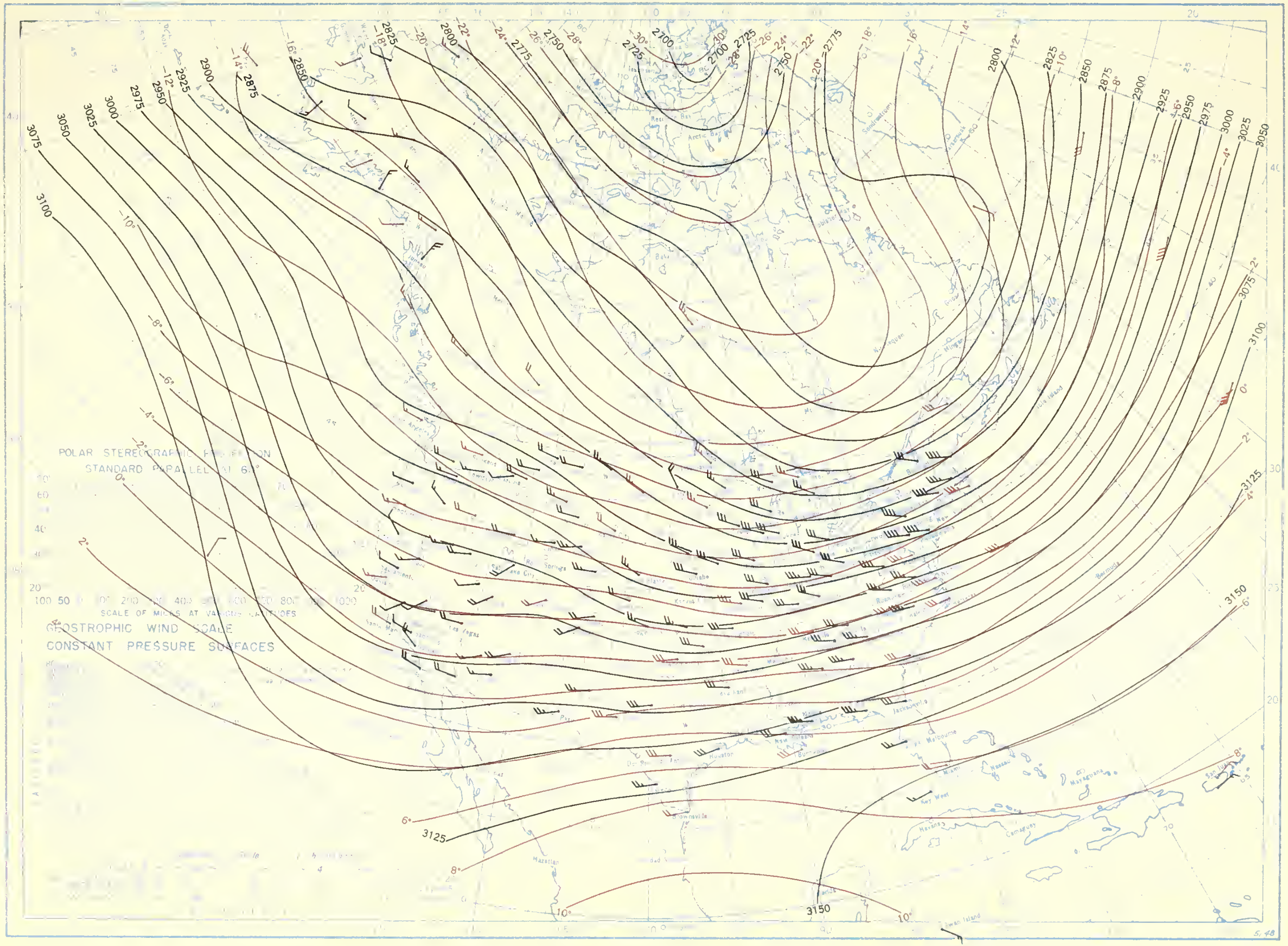
Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), March 1954.



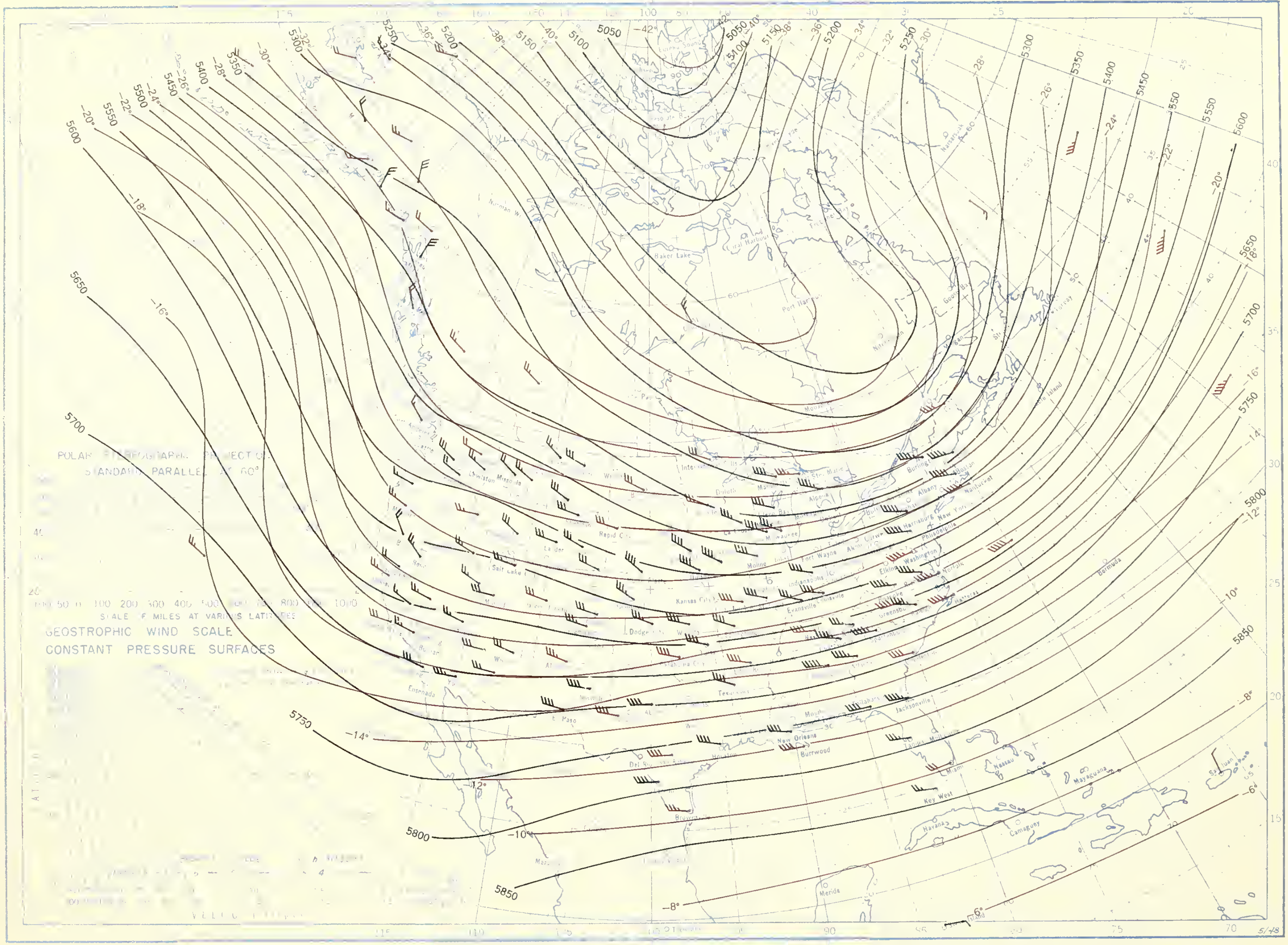
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m.. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), March 1954.



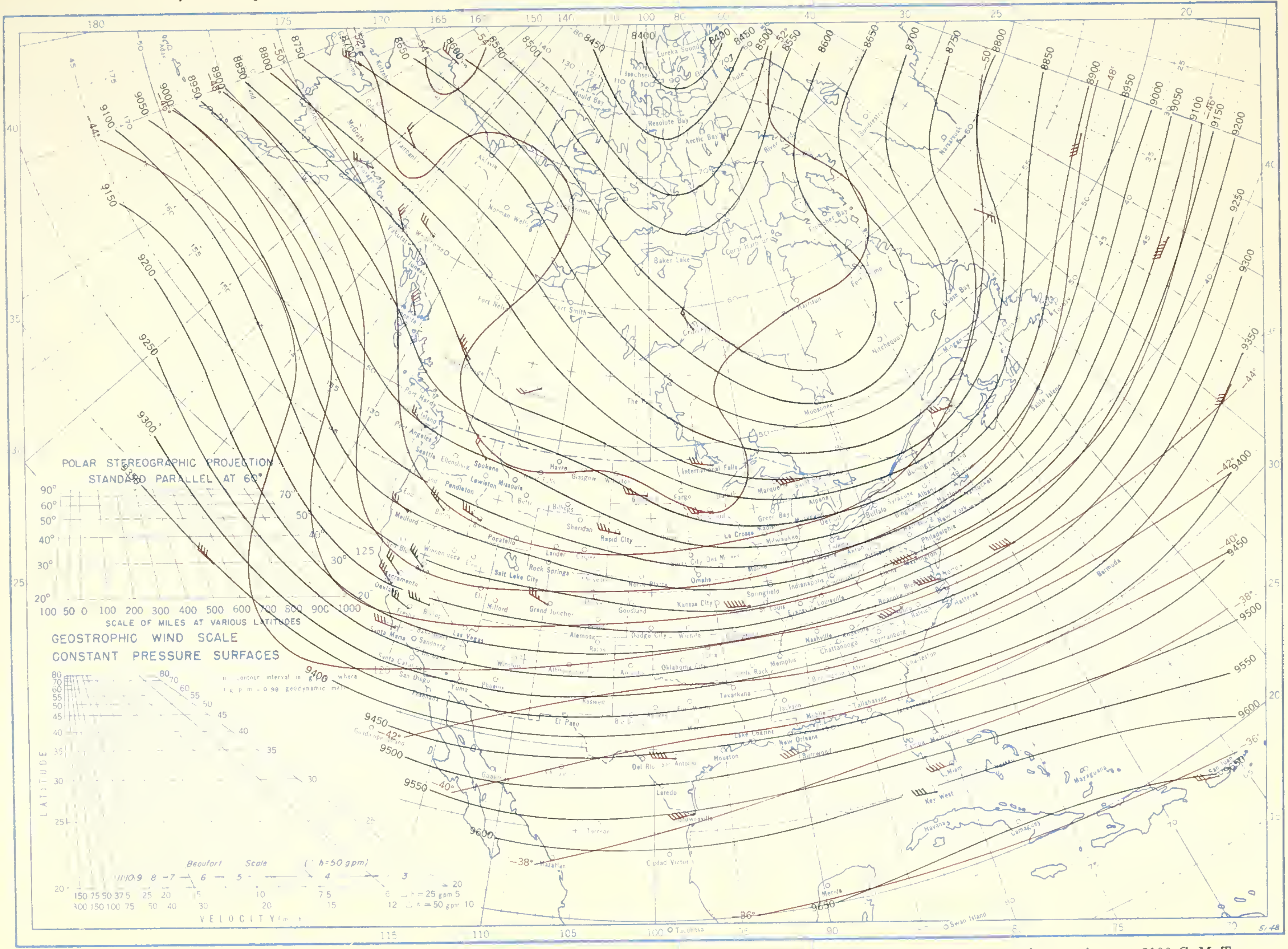
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), March 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; Wind barbs indicate wind speed on the Beaufort scale.

Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 300-mb. Pressure Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), March 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

APRIL 1954
Volume 5 No. 4

ASHEVILLE: 1954

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CHARTS I-XV

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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CLIMATOLOGICAL DATA
NATIONAL SUMMARY

Volume 5 No. 4 APRIL 1954

GENERAL SUMMARY OF WEATHER CONDITIONS

Drought breaking rains in Texas and Oklahoma were one of the main weather features of April 1954. Also of great importance was the heavy rainfall in the upper Mississippi and lower Missouri Valleys that helped replenish soil moisture reserves for the coming crop season. Nevertheless, precipitation was below normal in most of the Country; drought persisted in the extreme western portions of the central and lower Great Plains where crops, particularly small grains and pastures, remained in fair to poor condition; soil moisture continued seriously short in parts of the eastern Gulf region; and some sections of the far West needed rain at the end of the month. Although the month was unusually warm except along the Canadian Border west of the Great Lakes where temperatures averaged a few degrees below normal, there were two cold spells, the first nationwide during the first week, the second, occurring in the western half of the Country at the end of the month when a freeze damaged fruit and berries in parts of the Northwest. Thunderstorms during April were unusually frequent in the upper Mississippi Valley, the Great Lakes region, and east central Great Plains. At Omaha, Nebr., thunderstorms were observed on 8 days (5 more than normal), at St. Louis, Mo., on 11 (6 more than normal), and at Madison, Wis., on 10 days (7 more than normal). Measurable snowfall was generally limited to extreme northern areas and the higher mountain ranges of the far West. Sunshine, above normal in most of the Country, was below normal along the Canadian Border west of the Great Lakes, in central California, and the lower Great Plains. Fog was unusually frequent in the Southeast, occurring at Robertsdale, Ala., on 14 days.

PRECIPITATION.--Light to heavy rains in Texas and Oklahoma during the latter part of the month replenished moisture and water supplies, greatly improved winter grains and pastures and revived hopes for other crops in 1954. In Oklahoma the drought, persisting since early December 1953, was partially relieved in the southeastern portion by showers on the 7th and 8th and over most of the State by further shower activity from the 10th through the 13th and on the 15th, 22d, and 23d, and effectively broken in nearly all sections except the Panhandle and Northwest by moderate to heavy rain from the 27th through the 30th. Only widely scattered showers fell in Texas during the first week but moderate to heavy rains occurred in most of the State from the 8th through the 16th, in the north and west on the 22d and 23d, and over most of the State again from the 27th through the 30th. For Texas precipitation averaged 2.38 inches or 0.38 inch above normal and monthly totals ranged up to 10.58 inches at McAllen; while for Oklahoma the state-wide average of 3.53 inches was exactly normal and monthly totals ranged up to 7.93 inches at Ardmore.

In the upper Mississippi Valley and Great Lakes region the month was among the wettest Aprils on record. Monthly totals, ranging up to 9.36 inches at Menomonie, Wis., exceeded 8 inches at some stations in Iowa, Minnesota, and northern Missouri, and 7 inches in southern Michigan. For Saint Cloud, Minn., Escanaba and Alpena, Mich., totals of 5.31 inches, 5.23, and 4.73 inches respectively established new April records. The heaviest showers occurred during the latter part of the month, Morris, Minn., recording 6.90 inches on the 26th, and Sault Ste. Marie, Mich., 2.67 inches in a 24-hour period on the 26th and 27th (a new April record). Despite the heavy rainfall, fieldwork generally made good progress.

In much of the extreme western portion of the central and lower Great Plains precipitation was less than 25 percent of normal for April and less than half of normal for the 4-month period January through April. Goodland, Kans., measured only 0.01 inch during April.

TEMPERATURE.--The persistent warmer-than-normal weather in middle and southern areas resulted in the highest average temperatures on record for April at many stations, among which were Albuquerque, N. Mex., 62.8°; Springfield, Mo., 63.1°; Chattanooga, Tenn., 65.6°; Parkersburgh, W. Va., 60.5°; Cleveland, Ohio, 54.6°; Baltimore, Md., 60.2°; and Raleigh, N. C., 64.1°. Also for April state-wide averages for Arkansas, West Virginia, Virginia, New Mexico, and Oklahoma were the highest on record, and for Illinois, Kentucky, and Colorado, they were among the highest on record.

Highest temperatures, occurring in most of the far West and the North Central Interior near midmonth and in most of the remainder of the Country during the last decade, exceeded 90° in central California, the southwestern desert areas, the lower and east central Great Plains. Elsewhere they ranged in the 80's except near the Canadian Border where they were in the 60's and 70's. The month's highest temperature, 106°, was recorded at Boquillas Ranger Station, Texas, on the 19th.

The lowest temperatures of the month, occurring during the first week, were below zero in the extreme North and below freezing as far south as the northern portions of the Southern States. A minimum temperature of -17° at First Connecticut Lake, N. H., on the 5th was the lowest temperature ever recorded in New England during April. Big Falls Ranger Station, Minn., recorded -19° on the 3d for the month's lowest temperature.

The freeze in the Northwest at the end of the month caused considerable damage to fruit and berries in Oregon; the cherry crop was virtually wiped out in the Milton-Freewater area, pears were heavily damaged in the Medford area, most of the first strawberry blooms were killed in the western portion, and apples and pears in the Hood River district and cherries in the Willamette Valley were also badly damaged. In Idaho apricots were pretty well frozen out early in the month, and the freeze at the end did widespread damage to peaches, prunes, and cherries and lesser damage to apples in unheated orchards.

SNOWFALL.--April snowfall, above normal in Montana and a few adjacent areas and the upper Cascades, was generally much below normal or entirely absent elsewhere. For Montana, snowfall averaged 7.5 inches and ranges were covered most of the month. The worst storm of the month occurred in eastern Montana and North Dakota on the 28th when falls of up to 10 inches were measured at a few stations. In North Dakota glaze during this storm damaged power and communication lines.

In the Sierra Nevada Mountains Soda Springs, Calif., reported the highest monthly total, 20 inches, which was only 34 percent of normal for the station. For Colorado the state-wide average of 1.5 inches was a record low for April.

At the beginning of the month the snow cover in the extreme upper portions of the Mississippi Valley and Great Lakes region ranged up to 20 inches but by the end of the month only patches remained.

The snowpack in the far West at the end of April was normal or above in the northern mountains, but much below in the south. The snowpack in the Columbia Basin watershed at the end of the month, both in British Columbia and the United States, was the greatest that had ever been recorded, giving an excellent outlook for water supplies for all northern rivers in the Basin. In contrast the water content of the snowpack in the Colorado River drainage in Wyoming, Colorado and New Mexico was at a record low of 40 percent of normal due to excessive melting. Practically no snow was left in New Mexico. In Arizona, where winter snowfall was unusually deficient, runoff from this source was expected to be near the minimum of record.

DESTRUCTIVE STORMS.--Destructive storms during April 1954 accounted for nearly $10,000,000 damage, the death of 14 persons and injuries to at least 147.

The worst outbreak of storms occurred on the 30th in the lower Great Plains and Mississippi Valley during the passage of a low pressure trough and a system of fronts. Tornadoes, wind, and hail caused most of the damage, which totaled nearly $4,000,000. The greatest losses occurred in Texas and Iowa, each reporting estimates of well over $1,000,000. The losses in Texas occurred in the eastern half of the State as a result of numerous tornadoes and windstorms, particularly the latter, which did considerable damage in several cities among which were Fort Worth, Dallas, San Antonio, and Tyler. Most of the damage, $1,160,000 in Iowa on this date resulted from a family of 4 tornadoes that swept through the eastern portion of that State.

Severe thundersqualls in Flint and Genessee Counties, Mich., on the evening of the 7th damaged roofs and television aerials; total damage was estimated at $1,000,000.

A severe glaze storm occurred in northern North Dakota on the 28th. The accumulation of clear ice which was reported to be 1 inch or more thick disrupted power and communication lines and damaged television antennas. Total damage was estimated at more than $100,000.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1 APRIL 1954

Section	Temperature								Precipitation					
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes			
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least
	°F.	°F.		°F.			°F.		In.	In.		In.		In.
Alabama	67.8	+4.2	4 Stations	92	°14	Valley Head	28	1	3.48	-1.03	Alexander City 6NE	9.09	Mobile WB AP	0.48
Arizona	62.2	+4.3	Yuma WB AP	107	18	Alpine	7	1	.05	-.60	Flagstaff WB AP	.80	113 Stations	.00
Arkansas	66.4	+4.8	Camden 1	92	24	Bentonville	17	1	4.00	-.94	Monticello	8.19	Washita	1.00
California	60.1	+3.1	2 Stations	108	18	Soda Springs	-1	1	1.61	-.09	Cazadero	12.05	34 Stations	.00
Colorado	49.5	+5.6	Eversoll Ranch	93	°6	Taylor Park	-7	1	.47	-1.26	Pyramid	2.09	5 Stations	T
Connecticut	48.7	+2.2	Kent	86	21	3 Stations	6	4	4.40	+.65	Cockaponset Ranger Sta.	6.91	Wigwam Resvr.	2.93
Delaware	56.7	+3.9	Milford	86	20	Georgetown	23	2	3.77	+.23	Selbyville	6.31	Middletown 28	2.66
Florida	73.8	+3.8	2 Stations	95	29	Jasper 9ESE	36	18	3.47	+.40	Ft. Pierce	10.82	Apalachicola WB CO	.25
Georgia	68.3	+4.2	3 Stations	94	29	Tallapoosa 2NNW	27	2	2.49	-1.31	Flat Top	7.75	Blackbeard Island	.36
Idaho	45.5	+.3	Grandview	85	17	Island Park Dam	-2	1	1.37	.00	Burke 2NNE	6.93	Grasmere	T
Illinois	58.0	+5.5	Palestine	90	25	Stockton	11	3	4.15	+.60	Table Grove	9.40	Red Bud	1.34
Indiana	56.9	+5.7	Evansville	91	26	Waterloo	12	1	3.74	+.15	La Porte	9.64	Monroeville	1.69
Iowa	52.7	+3.8	3 Stations	92	14	Saratoga 2E	7	3	4.42	+1.81	Vinton	8.99	Glenwood 6SE	1.51
Kansas	60.1	+5.6	2 Stations	97	6	3 Stations	17	°1	1.94	-.61	Walnut 3SBW	7.65	3 Stations	.03
Kentucky	61.9	+5.7	Pikeville	91	20	2 Stations	19	1	3.73	-.22	Glasgow WKAY	8.04	Brent Dam 36	1.62
Louisiana	70.6	+3.3	Oberlin Fire Tower	93	7	do	32	1	3.22	-1.59	Evans	7.42	New Orleans Audubon	.58
Maine	40.9	.0	2 Stations	86	22	Long Falls Dam	-9	1	4.09	+.93	Machias	6.58	Bangor Dow Field	2.71
Maryland	57.5	+5.1	do	91	°14	Oakland	16	2	3.40	-.11	Salisbury	6.06	Picardy	1.28
Massachusetts	47.7	+2.2	5 Stations	88	°20	Charlton 2	7	4	4.45	+.85	Spot Pond	5.91	Salem Air Sta.	2.61
Michigan	45.1	+2.6	3 Stations	83	°21	Champion	-17	4	4.14	+1.73	Niles	7.10	Millington 3SW	1.46
Minnesota	41.9	-.4	Tracy Power Plant	90	14	Big Falls Ranger Sta.	-19	3	2.96	+.91	Morris WC School	8.54	Red Lake Falls	.95
Mississippi	68.7	+4.1	2 Stations	91	°29	Batesville	29	1	3.99	-.90	Beaumont	7.62	Biloxi Display	.32
Missouri	62.0	+6.6	Amity	92	°6	Bermitage	10	1	3.78	-.26	Maryville	8.57	2 Stations	1.35
Montana	39.3	-4.1	2 Stations	80	°12	2 Stations	-18	2	1.04	.10	East Glacier	4.78	Argenta	.05
Nebraska	52.9	+3.6	Niobrara	95	14	do	8	°1	1.62	-.76	Tekamah	5.31	Barrison 17N	T
Nevada	53.2	+4.0	North Las Vegas Dox	100	18	do	9	10	.50	-.28	Achurra Ranch	1.85	4 Stations	.00
New Hampshire	43.8	+1.7	3 Stations	88	°22	First Conn. Lake	-17	5	4.40	+1.26	Cannon Mtn.	8.43	Troy	2.61
New Jersey	53.1	+3.2	Canoe Brook	89	21	Layton 3NW	9	4	3.46	-.16	Pemberton 3E	5.34	Deepwater	1.60
New Mexico	57.7	+5.0	Jal	97	°10	3 Stations	11	°1	.30	.47	Carlsbad Caverns	5.81	42 Stations	.00
New York	46.9	+2.9	Dansville	90	22	Saranac Lake	-10	4	4.30	+1.28	Bighmarket	9.77	Whitney Point	1.85
North Carolina	63.2	+4.5	2 Stations	92	28	Celo 2S	21	2	2.81	-.66	Bighlands	9.51	Bridgewater Hydro	.99
North Dakota	39.1	-2.2	Ellendale	84	13	Belcourt Indian Res.	-16	3	1.22	-.20	Walhalla	3.22	Sentinel Butte 20S	.24
Ohio	56.4	+6.5	Portsmouth	94	21	2 Stations	13	1	3.90	+.65	Chardon	7.12	Ironton	1.80
Oklahoma	66.6	+6.1	Frederick	101	6	do	17	1	3.53	+.01	Ardmore CAA AP	7.93	Regnier	.24
Oregon	47.1	-.8	Illahe 1N	90	16	Fremont	6	10	2.05	-.01	Valsetz 2E	9.72	Redmond	.05
Pennsylvania	53.0	+4.3	Newell	91	22	2 Stations	7	4	4.06	+.56	Torpedo 4W	7.31	Artemas 1WNW	1.24
Rhode Island	47.8	+2.0	3 Stations	83	21	Kingston	9	4	5.00	+1.17	Austin	5.73	Block Island WB AP	4.38
South Carolina	66.5	+4.0	Tilghman Forest Nrsy	95	28	Union 7SW	30	2	2.89	-.34	Society Bill 6S	6.68	Fort Mill 4NW	.59
South Dakota	46.4	+.4	Vermillion	94	14	Bison	-6	2	1.19	-.88	Waubay Nat'l Wildlife	3.92	Mystic	.06
Tennessee	63.9	+5.2	3 Stations	89	°26	Dover 1NW	23	1	4.02	-.30	Murfreesboro Substa.	8.39	Thorn Bill	1.62
Texas	69.7	+4.5	Boquillas Ranger Sta	106	19	Spur	20	1	2.88	+.38	Mc Allen	10.58	Ysleta	T
Utah	51.5	+4.5	4 Stations	90	°17	2 Stations	4	°1	.55	-.69	Silver Lake Brighton	2.29	Callao	.00
Vermont	43.2	+1.6	Bellows Falls	88	22	Lemington	-12	5	4.09	+1.12	Peru	6.09	Northfield Norwich U	2.58
Virginia	59.8	+5.1	Charlottesville 2W	91	28	Big Meadows	16	4	2.66	-.62	Washington	5.07	Roanoke WB AP	1.08
Washington	45.4	-3.2	Trinidad 2SSE	89	16	Rainier Paradise RS	8	10	2.29	+.13	Quinault RS	11.36	4 Stations	T
West Virginia	57.9	+5.9	Ripley	93	22	Birch River 6SSW	14	2	3.06	-.46	Alderson	5.17	Berkeley Springs	.83
Wisconsin	45.7	+2.7	3 Stations	84	°14	2 Stations	-11	3	5.26	+2.79	Menomonie	9.36	Sheboygan	3.10
Wyoming	43.5	+2.6	Torrington Exp. Farm	86	23	Saratoga	-7	1	.59	-.99	Snake River	3.11	Fort Washakie	.00
Puerto Rico	75.1	-.2	Juncos (2)	94	°25	Utuado	54	19	4.02	-.16	San German	11.88	Melania Dam	.00

° Other dates also.

Note: Dates in Table 1 apply to the period 24 hours prior to time of observation. In some cases the actual occurrence is on the calendar date preceding that shown. (See individual Climatological Data for times of observations).

Table 2

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)				
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F.	°F	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
ALABAMA																																
Birmingham	610	995.3	1020.5	80	55	67.2	+5.3	87	14	34	1	0	0	55	69	3.20	-1.45	1.14	11	8	T	0	6.1	S	28	NW	16	8	9	13	5.8	68
Mobile	211	1012.9	1020.6	83	60	71.4	+4.7	90	13	44	1	1	0	61	77	.48	-4.62	.47	2	8	.0	0	9.5	S	---	---	--	6	19	5	5.6	--
Montgomery CO	201	------	------	81	59	69.8	+4.1	89	14	42	1	0	0	--	--	1.84	-2.79	.88	6	6	.0	0	----	---	---	---	--	--	--	--	----	--
Montgomery	198	1013.2	1020.5	82	52	69.2	+4.5	89	°30	41	1	0	0	56	72	2.06	-2.75	1.00	7	8	.0	0	7.0	ENE	37	SW	16	7	11	12	5.5	70
ARIZONA																																
Flagstaff	6993	------	------	64	28	46.3	+4.2	74	°17	19	1	0	25	--	--	.80	-.46	1.09	2	2	5.0	5	---	---	--	---	--	15	11	4	3.9	--
Phoenix	1114	972.9	1011.6	87	56	71.6	+4.5	96	18	45	1	11	0	40	34	.02	-.33	.02	1	0	.0	0	5.4	E	*35	WSW	30	23	4	3	2.2	98
Prescott	5014	846.9	1013.5	74	40	57.1	+4.2	84	18	28	1	0	3	22	31	.40	-.40	.47	2	1	T	T	9.0	SW	38	SE	°23	19	7	4	3.2	90
Tucson	2558	924.1	1011.4	87	56	71.5	+6.5	96	17	45	°1	11	0	22	17	.00	-.32	.00	0	0	.0	0	6.7	SE	31	SW	30	18	6	6	3.3	98
Winslow	4880	851.0	1011.8	77	41	59.2	+5.2	86	18	28	1	0	2	19	26	.12	-.37	.10	3	1	.0	0	10.0	WSW	*34	W	°14	18	9	3	3.3	--
Yuma	199	1006.1	1011.1	93	60	76.4	+3.6	107	18	48	1	21	0	33	25	.00	-.10	.00	0	0	.0	0	9.0	W	47	NW	30	27	1	2	1.6	97
ARKANSAS																																
Fort Smith	458	1000.0	1016.7	79	55	66.9	+4.3	88	26	26	1	0	1	53	66	4.37	-.12	1.76	10	7	.0	0	8.8	NE	33	W	30	8	11	11	5.8	58
Little Rock	257	1005.1	1018.0	79	57	67.8	+5.3	88	14	36	1	0	0	53	64	4.13	-1.03	1.33	10	7	.0	0	9.4	SSW	48	SE	30	6	9	15	6.6	60
Texarkana	361	1004.1	1017.7	80	58	69.0	+4.0	87	25	35	1	0	0	58	69	3.92	-1.38	1.22	10	7	.0	0	----	---	---	---	--	9	4	17	6.3	--
CALIFORNIA																																
Bakersfield	489	998.3	1016.4	80	53	66.7	+3.7	96	16	44	1	6	0	47	53	.06	-.69	.06	2	0	.0	0	6.6	NW	*27	NNW	30	14	6	10	4.4	--
Bishop	4108	873.0	1012.9	79	38	58.6	+3.9	90	°17	26	1	2	5	--	--	T	-.25	T	0	0	.0	0	----	---	---	---	--	14	9	7	4.3	--
Blue Canyon	5280	839.8	1015.9	50	41	49.6	+4.5	75	°15	28	30	0	4	--	--	6.93	+2.28	2.88	9	1	6.2	18	----	---	---	---	--	10	6	14	5.7	--
Burbank	699	989.8	1016.1	71	51	61.0	+.5	92	°16	42	°1	2	0	50	73	.16	-1.05	.14	3	0	.0	0	4.5	S	*16	SW	30	8	9	13	6.0	--
Eureka CO	43	1017.6	1020.0	56	45	50.3	-.3	67	16	35	1	0	0	--	--	2.78	-.10	.96	9	0	.0	0	8.0	---	37	W	26	9	5	16	6.5	53
Fresno	331	1004.1	1015.9	78	50	63.9	+2.4	94	°16	39	1	5	0	49	63	.48	-.48	.44	2	0	.0	0	5.9	NW	29	NW	30	13	9	8	4.4	86
Los Angeles CO	312	------	------	69	53	60.9	-.6	82	17	47	°1	0	0	51	76	.13	-1.04	.11	2	0	.0	0	5.2	---	25	W	30	9	9	12	5.8	59
Los Angeles	99	1012.9	1016.4	65	53	59.0	-.2	69	9	45	3	0	0	52	79	.11	-.85	.11	2	0	.0	0	6.5	WSW	%45	W	30	3	11	16	7.2	--
Mt. Shasta	3543	893.3	1017.8	62	37	49.4	+2.7	79	17	25	30	0	8	--	--	2.10	-.96	.87	8	0	.2	T	----	---	---	---	--	10	9	11	5.5	--
Oakland	3	1017.6	1018.1	67	50	58.5	+2.9	87	17	42	°1	0	0	48	73	1.67	+.21	1.12	5	1	.0	0	7.1	W	*24	W	30	9	9	12	5.8	--
Red Bluff	341	1003.7	1016.3	75	51	62.8	+2.8	94	17	39	9	5	0	43	54	1.24	-.55	.52	6	0	.0	0	9.9	SSE	34	SE	4	13	4	13	5.2	70
Sacramento	17	1015.6	1016.5	74	49	61.6	+3.4	90	17	38	1	1	0	49	68	1.62	+.24	1.27	4	1	.0	0	8.6	SW	32	NW	30	14	9	7	4.5	71
Sandberg CO	4517	863.2	1014.6	65	45	54.9	+4.4	81	21	35	7	0	0	--	--	.07	-.67	.07	2	0	.0	0	----	---	---	---	--	15	9	6	3.9	--
San Diego	19	1013.2	1016.5	67	55	61.0	+.5	74	16	50	4	0	0	52	77	.09	-.74	.08	2	0	.0	0	6.[illegible]	WNW	25	SW	30	3	16	11	6.7	49
San Francisco CO	52	------	------	63	51	57.0	+1.3	80	15	47	30	0	0	--	--	.82	-.67	.56	[illegible]	1	.0	0	9.2	---	29	W	30	10	10	10	5.6	66
San Francisco	1	1017.3	1018.0	65	48	56.7	+2.6	82	17	41	1	0	0	49	8[illegible]	1.03	-.2[illegible]	.66	5	0	.0	0	12.1	WNW	41	WNW	30	10	7	13	6.0	--
Santa Maria	231	1008.8	1017.6	67	4[illegible]	56.6	+.[illegible]	75	13	39	1	0	0	48	7[illegible]	.25	-.95	.24	3	0	.0	0	6.[illegible]	W	*27	W	30	8	12	10	5.7	--
COLORADO																																
Alamosa	7534	771.4	1016.2	67	27	46.8	+5.1	74	17	10	2	0	24	--	--	.32	-.22	.23	4	2	.2	T	----	---	---	---	--	12	13	5	4.5	--
Colorado Springs	6173	810.4	1014.5	67	37	52.0	+5.5	80	20	21	16	0	6	21	38	.62	-.78	.55	5	1	3.3	2	13.8	SSE	*40	N	15	10	12	8	5.1	--
Denver	5292	836.1	1012.1	69	38	53.6	+6.1	80	23	25	°3	0	7	20	34	.88	-1.17	.72	4	1	7.6	5	12.7	S	36	SE	11	6	15	9	5.8	73
Grand Junction	4849	858.5	1013.3	71	42	56.6	+4.8	82	23	30	1	0	2	25	33	.52	-.23	.28	4	3	T	T	9.2	ESE	40	W	20	10	12	8	5.1	76
Pueblo	4799	855.7	1013.5	74	39	56.7	+6.9	08	17	21	1	0	6	29	41	.95	-.29	1.26	3	2	1.4	1	9.7	WNW	56	W	25	7	15	8	5.6	75
CONNECTICUT																																
Bridgeport	7	1021.7	------	59	41	50.2	+3.9	76	°22	20	3	0	5	--	--	3.22	-.27	1.23	11	3	T	T	----	---	---	---	--	12	6	12	5.5	--
Hartford	15	1015.9	1022.0	61	39	50.1	+2.7	82	21	14	4	0	6	38	68	3.68	-.13	1.85	11	0	.3	T	10.1	SSW	35	S	2	9	9	12	6.1	60
New Haven	6	1018.0	1022.0	58	39	48.7	+2.6	73	20	17	°4	0	6	--	--	4.11	+.22	1.78	10	3	.1	T	8.4	---	26	SE	24	12	4	14	6.0	58
DELAWARE																																
Wilmington	73	1018.3	1021.7	68	44	55.6	+3.8	82	19	27	4	0	5	44	71	2.84	-.80	.91	12	5	T	T	9.7	S	---	---	--	11	8	11	5.7	--
DIST. OF COLUMBIA																																
Washington CO	72	------	------	72	49	60.2	+5.5	86	19	28	4	0	1	--	--	3.06	-.14	1.18	10	4	T	T	8.0	---	30	W	17	--	--	--	---	--
Wash. Nat'l AP	14	1017.3	1021.4	71	48	59.6	+5.2	84	19	28	4	0	1	46	64	3.30	+.24	1.64	9	4	T	0	11.7	SSW	42	NW	8	9	11	10	5.7	58
FLORIDA																																
Apalachicola CO	13	1018.6	1020.0	78	64	71.1	+3.6	83	12	53	°18	0	0	--	--	.25	-4.03	.24	2	2	.0	0	7.7	---	26	NW	16	17	10	3	3.4	78
Daytona Beach	31	1019.3	1020.7	81	63	71.9	+2.9	89	16	50	18	0	0	65	85	6.29	+3.36	2.57	9	5	.0	0	11.0	ENE	*25	N	1	4	14	12	6.5	--
Fort Myers	15	1019.0	1019.2	87	65	75.7	+2.7	91	30	53	18	2	0	66	79	3.49	+1.12	1.28	11	13	.0	0	7.8	E	*21	SW	16	6	20	4	5.1	--
Jacksonville CO	18	------	------	81	65	72.8	+3.7	89	29	52	18	0	0	--	--	.50	-2.54	.24	--	--	.0	0	----	---	---	---	--	--	--	--	---	--
Jacksonville	24	1020.0	1020.9	82	62	72.1	+3.7	92	29	43	18	2	0	62	76	.37	-2.97	.12	7	5	.0	0	10.3	ESE	34	NE	9	3	18	9	6.2	54
Key West	9	1016.9	1017.6	85	73	78.8	+1.8	87	°30	68	23	0	0	70	77	5.63	+3.23	2.59	14	2	.0	0	8.2	NE	25	NW	17	6	19	5	5.3	81
Lakeland CO	214	------	------	84	66	74.9	+3.3	92	29	56	18	2	0	--	--	3.63	+.76	1.00	12	8	.0	0	6.7	---	---	---	--	1	19	10	6.6	45
Miami CO	8	------	------	81	70	75.2	+1.1	87	2	60	18	0	0	--	--	8.67	+5.23	3.56	13	5	.0	0	12.3	SE	44	SE	7	7	19	4	5.4	69
Miami	8	1017.6	1018.6	84	70	76.6	+1.7	88	2	60	18	0	0	67	74	5.45	+1.46	2.35	13	5	.0	0	10.2	SE	*26	ESE	21	2	21	7	6.2	--
Miami Beach	9	------	------	81	73	76.8	+1.4	87	17	65	18	0	0	--	--	3.55	+.94	1.34	14	--	.0	0	----	---	---	---	--	9	5	16	---	--
Orlando	106	1015.9	1020.3	84	64	74.1	+2.5	91	29	55	18	3	0	65	79	4.44	+1.48	1.10	14	5	.0	0	9.3	ENE	*28	SE	21	4	19	7	6.0	--
Pensacola CO	13	1018.0	------	78	64	70.8	+3.8	85	12	50	°17	0	0	--	--	.98	-3.92	.47	3	2	.0	0	----	---	25	NW	16	--	--	--	---	78
Pensacola CAA AP	118	------	1020.3	--	--	----	----	--	--	--	---	--	--	62	--	----	-----	----	--	--	---	--	8.6	SSE	---	---	--	--	--	--	---	--
Tallahassee	64	1018.0	1020.[illegible]	8[illegible]	61	72.1	+4.9	90	3[illegible]	43	18	1	0	61	74	1.02	-3.47	.41	6	7	.0	0	5.2	ENE	---	---	--	6	19	5	5.5	--
Tampa	19	1018.6	1019.8	85	65	74.9	+3.4	90	30	54	18	1	0	65	77	2.48	-.03	.90	11	7	.0	0	9.6	E	30	ENE	22	5	17	8	5.7	67
West Palm Beach	15	1018.0	1018.8	84	69	76.2	+2.4	92	1	60	18	1	0	68	77	10.80	+6.67	3.58	17	7	.0	0	10.7	E	*33	NW	17	2	21	7	6.4	--
Georgia																																
Albany	190	1013.5	1020.7	83	60	71.4	+4.4	92	30	45	18	1	0	58	69	2.56	-1.61	1.47	6	5	.0	0	3.8	NE	---	---	--	6	13	11	5.9	--
Atlanta CO	1054	------	------	76	55	65.6	+4.1	84	°27	36	1	0	0	--	--	1.54	-2.71	.68	--	--	---	--	----	---	---	---	--	--	--	--	---	--
Atlanta	977	980.0	1021.6	76	55	65.5	+3.8	85	27	37	1	0	0	53	71	1.91	-2.51	.46	10	6	.0	0	9.4	E	33	NW	16	8	10	12	5.7	61
Athens	798	991.9	------	78	54	65.7	+4.0	89	28	41	2	0	0	--	--	1.55	-3.04	.79	8	5	.0	0	----	---	---	---	--	10	9	11	5.0	--
Augusta	143	1014.6	1021.3	80	53	66.7	+1.0	90	°28	36	2	3	0	57	76	2.48	-1.00	.82	11	5	T	T	6.3	NE	*29	WSW	29	8	13	9	5.6	--
Columbus	385	1006.8	1020.7	81	55	68.2	+4.8	88	°26	40	18	0	0	--	--	2.08	-2.15	.81	6	7	.0	0	----	---	---	---	--	9	10	11	5.3	--
Macon	356	1006.8	1020.4	82	57	69.2	+3.[illegible]	90	°27	41	18	2	0	56	69	2.62	-1.19	1.63	7	6	T	0	8.7	E	42	SW	16	9	10	11	5.6	73
Rome	637	998.0	------	78	52	64.7	+4.2	86	°27	32	2	0	1	--	--	2.68	-1.94	1.25	8	9	.0	0	----	---	---	---	--	8	9	13	5.5	--
Savannah	48	1019.3	1021.[illegible]	80	5[illegible]	68.7	+2.[illegible]	91	29	42	18	3	0	60	77	2.40	-.07	1.00	7	7	T	T	9.1	ENE	33	SW	16	4	16	10	6.1	58
Valdosta	200	1012.5	1020.7	83	5[illegible]	71.2	+3.[illegible]	92	°30	42	18	5	0	60	--	3.35	-.24	1.51	7	8	.0	0	7.7	E	---	---	--	6	16	8	5.9	--
IDAHO																																
Boise	2842	920.4	1016.8	63	37	49.9	.0	77	16	25	1	0	8	29	48	.42	-.68	.15	7	0	.2	T	10.1	SE	4[illegible]	NW	30	9	11	10	5.[illegible]	73
Idaho Falls, 46 W, CO	4933	------	------	60	28	44.0	----	73	17	10	10	0	18	--	--	.46	-----	.26	5	1	T	T	12.8	WSW	a3[illegible]	WSW	1	--	--	--	---	--
Idaho Falls, 43 NW, CO	4780	------	------	61	29	44.9	----	74	17	13	10	0	17	--	--	.40	-----	.23	3	0	T	T	9.7	SSW	a3[illegible]	SSW	5	--	--	--	---	--
Lewiston	1413	965.1	1017.3	61	38	49.3	-2.1	80	16	30	15	0	2	--	--	.74	-.40	.33	7	0	T	0	----	---	---	---	--	4	8	18	7.4	--
Pocatello	4444	861.8	1015.3	61	35	47.8	+1.5	73	24	19	11	0	14	24	43	1.01	-.31	.48	4	0	1.0	T	13.7	SW	4[illegible]	W	19	6	14	10	6.0	73
ILLINOIS																																
Cairo CO	314	1005.4	------	75	55	65.3	+5.3	88	27	32	1	0	1	--	--	3.28	-.68	.98	11	9	T	T	10.4	---	31	SW	18	8	9	13	6.0	65
Chicago	610	994.2	1017.6	64	43	53.3	+5.2	85	26	19	3	0	5	40	64	4.43	+1.61	1.60	13	8	T	T	11.0	SW	36	NW	7	2	11	17	7.5	46
Moline	589	996.3	1017.8	65	42	53.7	+3.8	85	°24	21	3	0	6	42	68	4.58	+1.57	1.15	11	11	T	T	11.2	SW	60	W	30	4	11	15	7.1	51
Peoria	654	995.3	1017.6	67	45	55.6	+5.1	85	26	22	°1	0	4	44	65	5.47	+2.03	1.93	13	10	T	0	12.8	---	43	S	30	5	11	14	6.9	63
Springfield	587	994.6	1018.0	69	46	57.5	+5.8	85	26	22	1	0	4	46	67	3.59	+.17	.88	11	7	.0	0	15.1	S	46	SW	30	6	8	16	6.8	67
INDIANA																																
Evansville	383	1003.7	1019.6	73	50	61.5	+4.4	85	°26	25	1	0	2	50	69	3.71	-.08	1.16	15	8	.0	0	10.6	SSW	42	W	6	6	9	15	6.2	66
Fort Wayne	801	986.8	1018.4	65	42	53.8	+6.0	84	26	23	1	0	7	44	70	2.73	-.52	1.12	13	8	T	T	13.7	SW	52	SW	7	4	3	23	7.8	43
Indianapolis	793	989.5	1019.0	69	46	57.4	+6.6	86	25	24	1	0	4	45	66	2.34	-1.51	.69	10	7	T	T	13.3	SW	54	SW	5	5	6	19	7.1	56
South Bend	768	989.8	1018.3	63	40	51.6	+4.3	81	26	18	1	0	8	42	72	5.55	+2.15	2.31	12	8	T	T	13.0	SSW	*35	NNW	24	3	7	20	7.8	--

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature										Average dew point	Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below			Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
INDIANA (Cont.)																																
Terre Haute	578	997.3	1018.6	69	46	57.7	+4.9	85	25	23	1	0	4	47	67	1.75	-1.94	.50	11	7	0.0	0	13.2	S	42	S	7	5	7	18	6.9	53
IOWA																																
Burlington	694	991.9	1017.8	66	43	54.8	+3.8	87	25	21	3	0	5	43	68	7.33	+3.90	1.64	11	10	.0	0	12.3	SSW	56	W	26	6	8	16	7.2	68
Des Moines	948	984.8	1017.1	66	42	53.8	+3.4	85	24	17	3	0	5	40	65	3.48	+1.03	.76	11	10	T	1	14.9	S	52	NW	15	3	11	16	7.3	62
Dubuque	1065	978.0	1017.6	61	39	49.7	+2.8	80	26	12	3	0	8	39	66	7.23	+4.54	1.60	12	10	T	T	----	---	--	---	--	5	7	18	7.4	--
Sioux City	1094	974.3	1016.0	64	39	51.4	+2.2	90	14	17	3	1	5	38	63	2.06	-.08	.58	12	7	T	3	14.3	S	52	NW	15	5	11	14	6.4	65
KANSAS																																
Concordia CO	1375	965.1	------	71	46	58.4	+4.4	89	6	21	3	0	4	--	53	1.42	-.84	.62	5	5	T	T	10.0	---	33	N	15	7	9	14	6.0	62
Dodge City	2594	926.5	1013.5	72	44	58.1	+4.3	90	24	23	3	1	5	39	54	.60	-1.66	.34	4	4	T	T	17.0	S	50	NE	19	7	11	12	5.9	73
Goodland	3645	886.9	1013.8	71	36	53.3	+6.1	87	25	21	3	0	8	28	48	.06	-1.75	.03	2	0	T	T	12.9	S	*33	N	6	8	12	10	5.3	--
Topeka	879	980.0	1015.9	73	48	60.5	+6.0	90	°6	26	3	2	3	44	60	2.22	-1.28	1.10	8	8	T	T	13.3	S	52	S	26	5	9	16	6.9	56
Wichita	1321	966.1	1014.5	75	50	62.4	+6.2	90	17	27	1	1	1	46	60	1.54	-1.98	1.04	5	4	.0	0	15.8	S	41	N	7	9	6	15	6.1	67
KENTUCKY																																
Lexington	979	984.1	1019.9	73	49	60.8	+7.9	85	°25	27	1	0	2	48	67	3.79	+.03	2.08	11	6	.0	0	13.3	SSW	---	---	--	6	10	14	6.3	--
Louisville CO	457	------	------	73	52	62.4	+5.9	85	25	31	1	0	1	--	--	2.64	-1.42	1.61	10	6	.0	0	----	---	---	---	--	--	--	--	---	--
Louisville	474	1002.4	1018.7	74	50	62.1	+6.1	87	25	26	1	0	2	49	67	3.05	-.96	1.40	14	5	T	T	9.8	SW	50	SW	26	6	10	14	6.0	69
LOUISIANA																																
Baton Rouge	64	1015.9	1018.8	83	61	71.9	+5.1	89	7	42	1	0	0	61	74	1.94	-2.56	1.58	6	6	.0	0	8.2	SE	---	---	--	5	13	12	6.0	--
Lake Charles	12	1017.3	1018.5	82	62	71.9	+3.9	86	°5	43	1	0	0	62	76	1.65	-2.62	1.09	7	5	.0	0	9.0	S	---	---	--	2	15	13	6.6	--
New Orleans	9	1017.3	------	82	65	73.4	+3.6	87	29	48	1	0	0	--	--	.89	-4.56	.39	5	4	.0	0	6.2	---	19	S	15	7	14	9	5.7	66
New Orleans	3	1017.3	1019.2	81	61	71.3	+3.0	86	°27	48	17	0	0	63	78	2.29	-3.11	1.17	6	6	.0	0	8.2	S	*30	SSW	16	5	20	5	5.1	--
Shreveport	252	1008.8	1018.1	81	60	70.2	+3.4	87	°25	39	1	0	0	59	72	3.93	-.66	1.30	7	3	.0	0	10.2	S	---	---	--	7	5	18	6.8	69
MAINE																																
Caribou	624	995.3	1019.9	44	27	35.5	+.8	67	22	3	5	0	23	24	66	3.80	+1.17	1.88	12	1	3.7	7	12.0	NW	*37	WNW	26	5	7	18	6.9	--
Portland	61	1016.9	1020.8	55	31	43.0	+1.1	73	22	8	4	0	12	34	72	4.31	+.56	2.43	11	0	.9	1	10.7	S	35	NW	3	7	8	15	6.3	58
MARYLAND																																
Baltimore CO	14	------	------	70	50	60.2	+5.9	83	14	29	4	0	1	--	--	3.04	-.68	1.03	12	--	---	--	----	---	---	---	--	--	--	--	---	--
Baltimore	146	1018.0	1021.9	69	45	57.1	+4.7	82	°14	28	4	0	4	44	67	3.07	-.65	1.07	11	4	.0	0	10.2	SW	70	W	23	10	8	12	5.4	59
Frederick	294	------	------	69	43	56.3	+3.4	83	°20	25	2	0	7	--	--	3.24	-.26	.94	13	--	.0	0	----	---	---	---	--	--	--	--	---	--
MASSACHUSETTS																																
Blue Hill Obs.	636	997.5	------	58	38	46.9	+3.2	84	21	12	4	0	7	--	69	4.94	+.94	2.69	13	1	2.6	1	17.0	SSW	46	NW	18	9	7	14	6.2	50
Boston	15	1016.9	1021.3	60	40	50.1	+2.9	85	°21	17	4	0	4	37	66	5.25	+1.79	2.69	10	1	2.1	2	13.5	SW	38	NW	18	9	9	12	6.2	63
Nantucket	43	1021.7	1022.2	51	38	44.8	+1.2	65	21	20	4	0	7	39	80	3.84	+.39	1.51	13	1	T	0	14.1	WSW	50	SW	18	7	12	11	6.2	63
Pittsfield	1153	977.7	1020.7	57	34	45.6	+3.6	80	21	11	3	0	12	--	--	4.10	+.49	1.42	16	--	1.0	1	----	---	---	---	--	--	--	--	---	--
MICHIGAN																																
Alpena CO	587	995.3	------	50	32	40.9	+1.3	76	21	7	3	0	11	--	--	4.73	+2.58	1.22	11	7	1.5	1	11.9	---	38	NW	17	5	11	14	6.6	54
Detroit	619	991.9	1018.9	61	40	50.2	+3.8	81	21	14	3	0	6	39	70	2.71	-.20	.84	14	8	T	3	11.7	E	47	NW	7	3	10	17	7.4	52
Escanaba CO	594	994.2	------	48	32	39.9	+1.7	61	19	3	3	0	10	--	--	5.23	+3.13	1.81	12	6	.8	1	11.4	---	31	N	27	6	11	13	6.3	54
Grand Rapids	681	992.6	1018.1	60	38	49.0	+4.2	80	21	13	°1	0	7	39	70	3.36	+.46	.66	12	8	T	1	12.7	WSW	50	W	7	3	9	18	7.7	38
Lansing	859	986.1	1018.8	60	37	48.5	+3.2	78	7	12	3	0	10	40	74	2.75	-.08	.70	13	7	.1	3	13.8	SSE	42	SE	7	4	7	19	7.5	44
Marquette CO	677	989.5	------	48	31	39.7	+1.0	70	13	4	3	0	13	--	--	3.31	+.80	1.43	12	5	.9	12	8.9	---	36	S	17	4	10	16	7.2	55
Muskegon	627	994.6	1018.3	57	38	47.6	+4.0	77	26	15	3	0	7	37	69	5.18	+2.84	1.72	11	9	.1	T	----	---	---	---	--	3	7	20	7.6	--
Sault Ste. Marie	721	994.9	1018.4	45	28	36.7	-.1	60	29	4	°3	0	17	30	78	5.16	+3.21	2.67	12	2	3.5	4	10.7	WNW	27	SE	10	5	12	13	6.9	42
Ypsilanti	722	989.5	1018.5	62	39	50.5	+3.9	82	21	14	3	0	7	40	69	2.61	-.33	.59	12	6	T	3	11.8	SW	*35	W	7	3	11	16	7.1	--
MINNESOTA																																
Duluth	1409	974.3	1016.6	46	27	36.7	-.1	68	13	-5	3	0	20	25	68	4.05	+1.55	2.27	11	5	.9	14	16.4	WNW	49	W	17	5	9	16	7.2	49
Intern'l Falls	1179	971.9	1016.3	45	24	34.2	-3.0	65	28	-14	3	0	25	23	67	1.34	-.39	.26	11	0	4.6	8	12.2	---	---	---	--	2	11	17	7.7	--
Minneapolis	830	982.7	1016.9	57	36	46.5	+.5	85	14	9	3	0	8	32	60	3.53	+1.62	1.57	11	7	.2	T	14.3	SSE	40	NW	17	6	12	12	6.4	51
Rochester	1017	978.7	1016.6	59	36	47.2	+2.2	83	14	6	3	0	9	32	61	4.68	+2.37	1.37	10	8	T	T	11.8	SSE	---	---	--	5	12	13	6.8	--
St. Cloud	1034	977.7	1016.3	53	31	42.0	-.9	74	13	3	3	0	14	30	64	5.31	+3.35	3.15	10	5	.4	1	9.5	NW	---	---	--	7	8	15	6.4	--
MISSISSIPPI																																
Jackson	315	1007.5	1019.2	83	58	70.4	+5.5	90	29	36	1	1	0	58	69	2.68	-2.14	1.04	7	6	.0	0	7.3	S	38	NW	16	8	13	9	5.3	71
Meridian	294	1006.1	------	82	56	68.9	+4.6	88	°30	38	1	0	0	--	--	3.58	-1.88	2.44	8	6	.0	0	----	---	---	---	--	10	12	8	5.2	--
Vicksburg CO	234	1009.5	------	80	60	70.3	+4.5	87	°29	37	1	0	0	--	--	4.80	-.04	2.20	9	8	.0	0	8.7	---	42	NW	16	7	12	11	5.9	69
MISSOURI																																
Columbia	778	987.5	1016.6	73	48	60.5	+6.0	87	°6	23	1	0	2	44	59	4.82	+1.02	2.23	11	10	T	T	11.4	S	50	NW	15	5	10	15	6.7	74
Kansas City	741	981.4	1016.3	72	50	60.7	+4.9	88	6	26	3	0	2	44	59	4.51	+.90	1.48	8	9	T	T	12.7	S	54	SW	26	5	6	19	7.2	52
St. Joseph	809	980.7	1015.7	71	47	58.8	+4.3	91	6	23	3	1	4	42	56	3.94	+.59	1.29	9	8	T	0	14.3	---	54	NW	15	5	8	17	7.0	63
St. Louis CO	465	997.0	------	74	51	62.4	+5.9	87	°5	30	°1	0	2	--	--	3.00	-1.01	.90	11	9	T	T	13.5	---	61	SW	30	7	11	12	5.9	72
St. Louis	552	997.0	1017.5	75	49	62.1	+6.5	88	°24	26	1	0	2	46	60	2.41	-1.52	.99	11	11	.0	0	10.2	S	---	---	--	5	10	15	6.5	--
Springfield	1265	969.2	1016.4	75	51	63.1	+7.6	85	6	25	1	0	1	49	63	3.93	-.41	1.38	4	6	.0	0	14.5	S	46	W	15	8	8	14	6.1	75
MONTANA																																
Billings	3568	889.9	1015.1	55	31	42.8	-3.4	74	16	11	2	0	17	26	55	1.19	+.14	.74	7	0	10.9	7	12.9	NE	60	NW	14	5	11	14	6.6	59
Glasgow CO	2090	941.1	1017.0	51	26	38.4	-6.7	74	12	-4	2	0	21	24	59	1.29	+.29	.58	12	0	10.5	5	----	---	---	---	--	3	5	22	7.8	--
Great Falls	3664	887.6	1016.7	48	26	37.0	-7.3	68	16	-6	2	0	23	20	57	.86	-.09	.40	11	0	10.1	4	17.3	SW	56	SW	9	5	6	19	7.2	55
Havre CO	2488	926.5	1017.6	48	27	37.3	-7.8	70	16	1	2	0	24	--	--	1.25	+.35	.29	13	0	8.3	5	9.5	---	47	W	16	2	6	22	8.3	35
Helena	3893	872.3	1016.4	53	27	39.9	-3.3	72	16	1	2	0	23	23	55	.73	-.15	.35	11	0	8.9	4	9.8	WNW	40	SW	°5	4	11	15	7.1	67
Kalispell	2965	------	------	50	30	39.6	-4.1	67	16	11	2	0	20	--	--	.45	-.57	.20	11	0	5.4	2	----	---	---	---	--	2	4	24	8.6	--
Miles City	2629	931.1	1016.6	55	29	42.3	-3.7	76	°13	7	2	0	20	29	--	.80	-.28	.35	10	1	1.3	3	12.7	NW	---	---	--	4	9	17	7.4	--
Missoula	3200	901.8	1017.4	54	31	42.7	-2.0	70	16	21	15	0	18	26	57	.68	-.22	.17	12	0	2.8	2	8.6	W	36	SW	6	3	7	20	7.6	49
NEBRASKA																																
Grand Island	1841	948.9	1015.4	67	39	52.[illegible]	+1.9	88	6	18	3	0	6	35	56	1.15	-1.07	.76	7	3	.0	0	14.8	SSE	---	---	--	5	9	16	6.8	--
Lincoln CO	1184	------	------	68	43	55.2	+2.6	88	6	20	3	0	5	--	--	2.40	+.11	1.10	9	5	T	0	10.9	---	51	NW	20	--	--	--	---	67
Lincoln	1180	------	------	68	40	54.1	+2.3	88	°6	18	3	0	7	37	--	2.47	+.36	1.09	7	5	T	0	13.6	S	--	---	--	4	10	16	6.9	--
Norfolk	1544	960.0	1016.2	64	38	50.9	+2.6	91	14	17	3	1	8	36	59	2.98	+.70	1.52	9	6	.0	T	----	---	--	---	--	5	12	13	6.5	--
North Platte	2779	915.3	1014.5	67	35	51.1	+2.4	84	°6	19	3	0	12	34	58	.12	-1.94	.06	4	2	.1	T	12.5	SE	*51	NNW	6	5	7	18	7.0	62
Omaha	978	976.0	1016.3	68	43	55.3	+3.1	91	25	19	3	1	5	41	63	2.89	+.74	.89	9	8	T	T	14.3	SSE	54	NW	20	4	14	12	6.4	67
Scottsbluff	3950	877.8	1014.1	66	34	49.9	+3.8	83	23	17	1	0	11	29	51	.34	-1.65	.27	3	1	.8	2	13.7	WNW	--	---	--	7	8	15	6.5	--
Valentine CO	2581	922.5	------	63	34	48.2	+1.3	83	23	14	3	0	13	--	--	1.37	-.60	1.01	7	3	T	T	11.2	---	45	W	28	5	13	12	6.6	71
NEVADA																																
Elko	5075	844.9	1016.3	65	29	47.0	+2.4	76	24	19	7	0	23	25	47	.60	-.33	.41	6	0	T	T	7.0	SW	*41	W	8	8	7	15	6.6	--
Ely	6257	808.3	1015.6	63	29	46.1	+2.4	75	17	12	1	0	24	21	40	.54	-.66	.38	4	2	1.0	1	11.6	---	40	SW	27	10	11	9	5.3	78
Las Vegas	2162	946.2	1010.7	85	55	69.6	+4.0	96	18	42	1	8	0	26	22	T	-.24	T	0	0	.0	0	10.6	SW	*48	SW	5	19	7	4	3.2	93
Reno	4397	862.5	1016.6	69	32	50.4	+2.7	82	°16	22	°10	0	16	28	46	.21	-.25	.11	3	1	.0	T	7.6	WNW	47	SE	5	11	12	7	4.6	76
Winnemucca	4299	867.9	1016.2	67	31	49.4	+2.6	80	16	16	7	0	19	24	40	.23	-.60	.17	4	0	T	0	8.8	---	45	W	5	6	11	13	6.2	76
NEW HAMPSHIRE																																
Concord	339	1009.8	1020.8	59	32	45.5	+2.5	86	20	9	4	0	13	33	65	3.73	+.65	1.76	10	0	.2	T	7.4	NW	37	NW	3	9	6	15	6.1	53
Mt. Washington	6262	805.3	1018.3	32	16	24.1	+2.1	54	22	-20	4	0	26	--	85	5.90	+.03	1.58	18	0	17.1	14	35.0	W	x100	W	6	4	9	17	7.1	40

See footnotes at end of table.

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
NEW JERSEY																																
Atlantic City CO	8	1020.0	1022.0	58	45	51.5	+2.1	70	7	27	4	0	2	--	--	3.33	0.07	1.49	12	4	T	T	16.8	---	50	S	16	12	8	10	5.0	69
Newark	11	1020.3	1021.8	63	43	53.1	+3.1	83	22	23	4	0	5	40	66	2.58	-.69	1.23	10	1	0.4	T	11.0	SSW	*35	NW	12	14	4	12	5.3	--
Trenton CO	56	1014.6	1021.7	66	44	54.6	+3.9	83	19	24	4	0	5	--	--	3.37	+.37	1.39	10	4	T	T	10.3	---	*30	NW	8	15	2	13	5.2	62
NEW MEXICO																																
Albuquerque	5310	847.6	1011.1	77	49	62.8	+7.3	86	18	34	1	0	0	23	26	T	-.53	T	0	0	.0	0	10.2	SE	54	E	11	15	6	9	3.9	87
Clayton	4969	844.6	1012.7	73	41	56.8	+5.8	85	°6	21	1	0	2	--	--	.53	-.60	.36	4	3	T	T	----	---	---	---	--	14	10	6	4.1	--
Roswell	3612	892.0	1012.0	83	47	64.8	+5.1	93	20	31	1	6	1	25	31	.11	-.64	.09	2	1	.0	0	10.7	---	52	NW	14	11	10	9	4.8	--
NEW YORK																																
Albany	277	1016.6	1020.5	60	37	48.5	+3.4	85	°22	14	4	0	8	35	65	3.05	+.44	.84	14	1	.4	T	10.7	SSE	49	W	8	8	7	15	6.5	50
Binghamton	1601	960.0	1020.1	58	36	47.1	+4.5	81	21	11	4	0	8	36	70	3.50	+.26	.86	17	3	1.0	T	12.5	SSE	38	NW	°3	5	9	16	7.2	52
Buffalo	693	991.2	1019.7	58	37	47.3	+3.5	84	21	12	3	0	7	38	70	3.95	+1.40	1.07	15	6	1.2	5	14.2	SW	56	SW	°6	2	12	16	7.3	51
New York CO	10	1007.1	------	62	44	53.0	+3.2	75	8	23	4	0	3	--	--	2.51	-.71	1.40	11	1	.1	T	12.6	---	49	NW	3	14	5	11	4.9	63
New York	19	1020.3	1022.0	63	45	53.9	+3.8	79	8	24	4	0	3	40	65	3.44	+.34	1.74	10	1	T	T	13.5	SSE	50	NW	3	14	3	13	5.4	--
Rochester	543	1000.0	1019.5	57	37	47.0	+2.5	80	22	13	3	0	7	39	75	2.75	+.11	.79	14	5	1.4	8	10.5	S	45	W	6	4	12	14	6.9	49
Schenectady	217	------	------	61	38	49.3	+4.2	86	20	16	4	0	7	--	--	3.08	+.03	.73	13	0	.5	1	----	---	---	---	--	16	5	9	---	--
Syracuse	424	998.3	1020.7	59	37	48.1	+2.1	87	21	10	4	0	7	37	69	4.75	+1.63	.96	17	4	3.6	6	9.9	E	43	NW	22	7	5	18	6.7	54
NORTH CAROLINA																																
Asheville CO	2203	------	------	73	49	61.2	+5.7	83	27	33	1	0	0	--	--	1.81	-1.05	.49	13	7	T	0	8.9	---	29	NW	1	8	15	7	5.1	67
Asheville	2093	947.9	1021.7	--	--	----	----	--	--	--	--	--	--	50	76	-----	-----	----	--	--	---	--	4.1	NNW	---	---	--	--	--	--	---	--
Charlotte	753	993.9	1021.9	75	53	63.6	+3.9	87	28	37	5	0	0	52	71	3.60	+.43	1.76	13	9	T	0	6.8	S	34	S	16	7	12	11	6.0	69
Greensboro	891	990.2	1022.4	74	50	61.8	+4.7	87	26	30	5	0	2	50	69	2.52	-.83	1.35	9	5	.0	0	8.6	SW	30	SSW	16	7	11	12	5.9	63
Hatteras	4	1021.7	1022.6	70	58	63.8	+4.2	78	°26	39	2	0	0	57	80	1.54	-1.54	.44	8	3	.0	0	12.1	SSW	43	SW	17	11	9	10	5.5	58
Raleigh CO	400	------	------	76	52	64.1	+4.4	88	8	35	°5	0	0	--	--	2.59	-.93	1.49	8	2	.0	0	6.4	---	20	SW	°27	9	14	7	5.4	64
Raleigh	438	1006.4	1022.2	76	51	63.6	+5.1	88	°27	34	2	0	0	52	69	2.83	-.70	1.82	8	4	.0	0	8.5	SW	---	---	--	7	15	8	5.7	--
Wilmington	30	1021.3	1022.7	76	55	65.5	+3.3	88	28	37	2	0	0	--	--	3.44	+.73	1.25	9	4	.0	0	10.0	---	45	W	28	9	13	8	5.3	70
Winston-Salem	967	986.8	1022.1	74	51	62.5	+5.0	86	26	31	5	0	2	49	66	1.60	-1.80	.68	9	5	.0	0	9.4	SSW	*35	SSW	16	8	12	10	5.6	--
NORTH DAKOTA																																
Bismarck	1650	949.5	1016.8	54	28	40.6	-2.5	78	13	-2	3	0	18	27	63	.56	-.83	.32	8	0	.9	1	13.2	WNW	56	W	°10	2	12	16	7.4	57
Devils Lake CO	1471	961.7	------	48	27	37.5	-2.5	74	12	-3	2	0	18	--	--	1.37	-.07	.62	9	0	4.7	4	11.2	---	42	NW	17	4	9	17	7.5	54
Fargo	895	981.0	1016.3	52	31	41.2	-.9	77	13	1	3	0	14	28	64	1.13	-.75	.38	8	2	.5	1	18.6	SSE	59	NW	17	4	8	18	7.5	47
Williston CO	1877	947.9	1016.8	49	27	38.0	-4.9	73	12	-3	2	0	20	25	63	.90	-.17	.71	6	0	6.1	4	9.2	---	34	W	10	1	10	19	7.9	61
OHIO																																
Akron	1210	981.7	1020.1	65	42	53.4	+6.3	83	21	18	3	0	7	43	73	4.82	+1.62	.83	16	7	.1	T	10.5	SW	---	---	--	4	10	16	6.8	--
Cincinnati Obs.	761	------	------	72	49	60.9	+7.3	87	25	27	1	0	3	--	--	3.03	-.61	1.08	14	7	T	0	7.3	---	24	SW	6	--	--	--	---	62
Cincinnati	869	987.1	1019.4	71	48	59.7	+7.6	87	25	23	1	0	4	45	64	2.55	-1.04	.80	14	7	T	0	11.3	SSW	30	SSW	6	7	6	17	7.0	--
Cleveland CO	663	------	------	64	44	54.1	+6.1	85	21	19	3	0	5	--	--	4.30	+1.39	1.12	15	--	---	--	----	---	---	---	--	--	--	--	---	--
Cleveland	787	991.2	1019.2	66	44	54.6	+7.3	85	21	19	3	0	7	44	70	5.36	+2.63	1.37	17	[illegible]	T	T	11.2	S	58	SW	7	3	11	16	7.2	51
Columbus CO	724	------	------	69	48	58.6	+7.2	84	26	26	°4	0	5	--	--	2.64	-.55	.72	9	--	.5	1	----	---	---	---	--	--	--	--	---	--
Columbus	815	989.5	1019.6	70	45	57.4	+7.2	85	°26	22	1	0	5	46	70	3.77	+.33	1.11	11	6	.9	1	9.2	SSW	32	W	2	5	9	16	6.9	64
Dayton	1002	982.4	1019.1	70	45	56.6	+6.1	83	°26	23	1	0	5	46	72	3.19	+.12	.87	13	[illegible]	1.2	1	10.6	SSW	42	NW	8	5	6	19	7.2	69
Portsmouth CO	715	------	------	74	47	60.6	+7.4	88	26	24	2	0	6	--	--	2.94	-.53	.62	10	6	T	T	7.0	---	50	SW	6	--	--	--	---	--
Sandusky	603	997.0	------	63	45	54.1	+6.2	85	21	21	3	0	4	--	--	3.98	+1.02	1.37	15	10	T	1	9.0	---	46	W	7	5	13	12	6.6	60
Toledo	622	995.3	1018.9	63	41	51.9	+5.4	82	°21	17	1	0	7	43	74	3.06	-.19	.81	13	[illegible]	T	1	12.3	SSW	45	SW	15	4	9	17	7.2	50
Youngstown	1178	977.0	1018.5	65	40	52.7	+5.5	84	21	16	4	0	7	41	69	5.06	+1.42	1.01	16	7	.1	T	10.6	SW	*35	WNW	22	1	11	18	7.3	--
OKLAHOMA																																
Oklahoma City	1280	971.6	1015.0	77	55	65.6	+5.3	94	6	31	1	1	1	52	66	3.04	-.13	1.16	8	7	.0	0	17.1	SSE	59	SW	29	9	5	16	6.0	67
Tulsa	672	991.2	1015.3	78	55	66.4	+5.7	88	18	28	1	0	1	52	63	4.60	+.35	2.96	5	4	.0	0	13.3	S	35	SW	18	10	4	16	6.0	58
OREGON																																
Astoria	12	1020.0	1021.2	54	39	46.5	-3.2	68	11	30	27	0	1	39	76	4.70	+.52	1.21	16	0	T	T	8.4	NW	---	---	--	6	4	20	8.0	--
Burns CO	4140	873.4	1017.0	61	32	46.4	-.2	78	16	20	7	0	17	24	47	.37	-.45	.13	7	0	T	T	----	---	---	---	--	9	10	11	5.8	--
Eugene	361	1006.4	1020.2	61	38	49.7	-1.2	76	16	20	29	0	3	40	71	2.55	+.01	.94	11	0	.0	0	9.0	N	*35	SW	5	8	7	15	6.4	--
Meacham	4050	------	------	50	30	40.2	-.9	67	16	22	29	0	22	--	--	2.67	-.25	1.42	11	2	2.0	1	----	---	---	---	--	6	7	17	6.9	--
Medford	1312	970.9	1018.7	68	38	53.1	+.8	87	16	29	1	0	3	39	63	.94	-.25	.40	7	0	T	0	3.5	NNW	*22	WNW	6	6	10	14	6.2	--
Pendleton	1489	963.8	1018.0	61	38	49.6	-2.7	78	16	32	°9	0	2	38	49	.52	-.52	.15	8	1	T	T	9.3	WSW	---	---	--	8	9	13	6.2	--
Portland	22	1014.2	1019.9	59	40	49.6	-2.2	73	16	31	10	0	1	39	69	2.54	+.43	.74	11	0	T	T	8.1	NW	34	S	5	[illegible]	8	17	7.0	57
Roseburg	505	1001.0	1020.0	64	38	51.0	----	83	16	28	29	0	4	--	--	2.30	+.17	.71	11	0	.0	0	5.5	---	21	S	3	[illegible]	10	16	6.7	57
Salem	195	1012.5	1020.2	61	37	48.9	-2.5	76	16	26	29	0	9	39	70	2.70	+.31	.91	14	0	T	0	7.5	S	---	---	--	[illegible]	7	15	6.6	--
Sexton Summit CO	3836	------	------	55	36	45.5	+1.2	76	16	25	°29	0	11	--	--	2.79	+.71	1.49	10	0	.7	T	----	---	---	---	--	7	12	11	6.2	--
PENNSYLVANIA																																
Allentown	376	1007.1	1021.7	65	40	52.5	+4.0	81	°21	20	°4	0	8	41	70	2.01	-.58	.77	9	4	T	T	10.4	S	---	---	--	10	9	11	5.9	--
Harrisburg	335	1007.5	1021.5	67	44	55.4	+4.5	84	21	24	4	0	4	41	62	3.58	+.61	1.43	14	3	T	0	9.4	SE	38	NW	3	10	3	17	6.2	52
Park Place CO	1932	------	------	58	36	47.2	+3.8	77	°22	11	4	0	9	--	--	3.61	+.08	1.61	12	--	.2	T	----	---	---	---	--	10	5	15	5.9	--
Philadelphia CO	26	------	------	66	46	56.0	+3.3	83	19	26	4	0	3	--	--	3.92	+.54	1.13	9	3	T	0	9.0	---	26	N	°3	12	4	14	5.5	66
Philadelphia	13	1017.3	1021.6	68	45	56.3	+4.7	85	19	26	4	0	3	43	65	3.75	+.37	1.09	9	3	T	T	11.1	WSW	*28	WSW	°13	11	5	14	5.7	--
Pittsburgh CO	749	------	------	70	47	58.7	+6.9	86	21	23	°4	0	5	--	--	3.91	+.83	1.20	13	--	.1	T	----	---	---	---	--	--	--	--	---	53
Pittsburgh	1151	989.5	1019.9	68	44	55.8	+7.0	84	21	20	4	0	7	42	64	3.11	-.08	.75	11	5	.1	T	11.7	SW	*39	SW	6	3	9	18	7.2	62
Reading CO	266	1009.1	1021.3	67	45	56.3	+5.0	83	°21	23	4	0	3	--	--	2.59	-.65	.90	11	3	.2	T	12.2	---	45	W	17	10	7	13	5.8	52
Scranton CO	746	991.5	1021.0	63	41	52.3	+4.5	83	°22	18	3	0	6	--	--	4.02	+.99	1.29	13	3	.3	1	7.0	---	38	NW	17	10	8	12	5.8	54
Williamsport	527	1001.4	1020.6	64	41	52.6	+3.5	83	°22	18	4	0	7	40	65	3.25	-.29	.85	14	4	T	T	8.7	ESE	*43	SSE	°8	7	10	13	6.5	--
RHODE ISLAND																																
Block Island	110	1016.9	1021.2	53	40	46.3	+1.4	66	7	21	4	0	5	--	--	4.38	+1.01	1.91	15	2	1.1	T	----	---	---	---	--	10	8	12	5.6	--
Providence	55	1015.6	1021.6	60	39	49.6	+3.6	83	21	14	4	0	6	38	68	4.91	+1.54	2.41	11	1	.6	1	14.4	SW	*38	WSW	°2	9	8	13	6.0	62
SOUTH CAROLINA																																
Charleston CO	9	------	------	75	61	68.4	+2.8	85	28	49	2	0	0	--	--	1.27	-1.18	.56	8	5	.0	0	10.7	---	43	NE	9	6	13	11	6.3	68
Charleston	41	1020.0	1021.7	79	56	67.3	+3.0	88	°28	43	°18	0	0	59	81	2.25	-.57	.80	9	3	.0	0	9.5	ENE	---	---	--	4	13	13	6.4	--
Columbia CO	332	1008.5	------	79	57	67.8	+4.0	89	8	45	2	0	0	--	--	1.94	-1.56	.82	10	2	.0	0	----	---	---	---	--	8	11	11	5.7	--
Columbia	217	1012.9	1021.2	79	54	66.8	+3.3	91	28	35	2	2	0	56	74	2.09	-1.45	.79	9	4	.0	0	6.5	NE	---	---	--	9	9	12	5.6	72
Florence	146	1016.3	1021.7	79	55	67.0	+3.6	93	28	39	2	1	0	--	--	1.75	-1.92	.55	8	5	.0	0	----	---	---	---	--	7	12	11	5.9	--
Greenville	1018	984.1	1021.2	75	54	64.6	+4.4	88	28	40	2	0	0	51	68	1.19	-2.63	.33	15	3	.0	0	8.6	ENE	36	S	16	9	9	12	5.9	60
Spartanburg	801	------	------	75	54	64.2	+3.7	87	28	40	°5	0	0	--	--	1.71	-1.84	.44	11	6	.0	0	----	---	---	---	--	9	10	11	5.8	--
SOUTH DAKOTA																																
Huron	1282	968.2	1016.0	60	34	46.6	+.2	86	14	10	3	0	12	31	61	.81	-1.11	.29	9	2	3.1	1	14.6	SSE	50	NW	9	6	10	14	6.5	57
Rapid City	3165	900.4	1015.8	60	34	45.9	+1.4	82	27	16	2	0	15	27	55	.27	-1.74	.10	6	0	.1	T	13.0	NNW	47	NW	6	3	9	18	7.3	46
Sioux Falls	1420	964.1	1016.1	62	35	48.3	+1.[illegible]	91	14	11	3	1	9	31	55	1.32	-1.03	.75	6	3	T	T	14.4	SSE	*37	N	7	7	10	13	6.5	--
TENNESSEE																																
Bristol	1519	966.8	------	75	48	61.8	+5.[illegible]	85	20	31	2	0	2	--	--	1.83	-1.42	.67	15	7	.0	0	----	---	---	---	--	11	6	13	5.6	--
Chattanooga	670	992.9	1020.8	79	53	65.6	+5.9	87	15	32	2	0	1	53	70	1.72	-2.81	.49	10	3	.0	0	6.4	S	28	W	16	9	7	14	5.7	72
Knoxville	950	985.4	1020.9	77	52	64.6	+5.6	86	15	33	1	0	0	52	67	2.24	-1.40	1.07	12	6	.0	0	7.4	WSW	48	W	28	10	9	11	5.2	85
Memphis CO	271	------	------	77	59	67.6	+5.4	86	26	35	1	0	0	--	--	3.47	-1.23	1.55	10	--	.0	0	----	---	---	---	--	--	--	--	---	--
Memphis	263	1004.1	1018.6	78	57	67.2	+5.4	88	26	34	1	0	0	54	66	4.34	-.46	1.75	12	6	.0	0	10.2	S	3[illegible]	S	°6	7	10	13	5.[illegible]	69
Nashville	577	1000.0	1019.9	77	54	65.3	+5.6	87	26	30	1	0	2	53	68	4.42	+.7[illegible]	2.19	11	6	.0	0	8.2	S	3[illegible]	NW	16	9	8	13	5.7	59
Oak Ridge CO	905	987.1	------	76	50	63.3	+5.6	86	15	28	[illegible]	0	1	--	--	1.8[illegible]	-2.2[illegible]	.72	10	5	.0	0	4.9	---	1[illegible]	SW	15	12	7	11	5.[illegible]	--

See footnotes at end of table.

CLIMATOLOGICAL DATA

Table 2—Continued

State and station	Elevation (ground)	Pressure: Station	Pressure: Sea level	Temperature: Average maximum	Temperature: Average minimum	Temperature: Average	Temperature: Departure from normal	Temperature: Highest	Temperature: Date	Temperature: Lowest	Temperature: Date	No. of days: Max. 90° F. or above	No. of days: Min. 32° F. or below	Average dew point	Average relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Greatest in 24 hours	No. of days: .01 inch or more	No. of days: With thunderstorms	Snow, Sleet, Hail: Total	Snow, Sleet, Hail: Max. depth on ground	Wind: Average hourly speed	Wind: Prevailing direction	Fastest mile: Speed	Fastest mile: Direction	Fastest mile: Date	No. of days (sunrise to sunset): Clear	No. of days (sunrise to sunset): Partly cloudy	No. of days (sunrise to sunset): Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.		*		°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
TEXAS																																
Abilene	1759	952.3	1013.4	82	58	70.1	+5.6	96	6	31	1	3	1	53	60	4.28	+1.81	2.00	6	6	T	T	15.4	SSE	52	SE	30	12	4	14	5.6	72
Amarillo	3590	888.6	1012.6	76	47	61.4	+5.8	91	6	29	1	1	1	39	52	2.31	+.86	1.27	5	5	T	0	15.6	SW	49	N	15	11	8	11	5.1	70
Austin	615	994.6	1016.3	83	62	72.4	+4.5	89	7	43	1	0	0	61	72	1.66	-2.30	.83	8	3	.0	0	11.3	S	32	N	16	7	9	14	6.3	42
Brownsville	16	1012.9	1015.3	83	69	76.0	+2.3	95	30	54	°1	1	0	67	78	.92	-.64	.52	6	2	.0	0	16.6	SE	35	SE	4	4	15	11	6.3	75
Corpus Christi	40	1015.2	1016.3	82	67	74.5	+3.5	93	30	49	1	1	0	66	81	2.98	+1.24	1.00	5	6	.0	0	14.6	SE	34	SE	8	3	12	15	6.9	54
Dallas	487	997.6	1016.1	82	61	71.3	+5.0	90	°6	35	1	2	0	58	66	4.62	+.75	2.08	9	7	T	0	15.0	SSE	56	W	27	8	10	12	5.9	50
Del Rio	1091	980.0	1012.8	84	63	73.3	+2.2	91	28	48	2	2	0	59	66	3.66	+2.21	1.39	8	6	T	T	9.1	ESE	34	E	12	5	6	19	7.2	42
El Paso	3920	885.2	1011.5	83	55	68.6	+5.5	90	°18	42	1	2	0	27	25	.19	-.08	.09	3	4	.0	0	10.1	W	40	N	21	14	6	10	4.3	90
Fort Worth	544	995.6	1016.2	81	60	70.7	+4.8	90	°6	33	1	2	0	56	63	3.62	-.23	1.90	9	6	T	0	15.3	S	•40	WSW	°27	8	9	13	6.0	--
Galveston CO	7	------	------	75	68	71.1	+2.2	80	28	47	1	0	0	--	--	2.02	-1.07	1.80	4	--	.0	0	12.3	---	37	N	16	--	--	--	---	60
Galveston	5	1015.6	1018.1	75	67	71.1	+2.0	81	28	46	1	0	0	66	85	2.14	-1.26	1.78	5	2	.0	0	12.5	SSE	---	---	--	8	7	15	6.5	--
Houston CO	41	1012.5	------	80	65	72.4	+2.9	87	28	44	1	0	0	--	--	6.09	+2.69	3.14	7	3	.0	0	11.0	---	34	W	30	4	12	14	6.9	55
Houston	50	1014.6	1017.5	81	62	71.5	+3.1	89	28	45	1	0	0	63	77	2.81	-.28	1.58	6	4	.0	0	15.3	SSE	---	---	--	3	12	15	7.0	--
Laredo	500	998.6	1014.0	89	68	78.5	+2.6	99	29	51	1	15	0	64	67	1.12	-.49	.75	6	4	.0	0	16.2	SE	•29	E	9	6	10	14	6.2	--
Lubbock	3243	902.1	1012.6	79	50	64.6	+5.1	91	20	29	1	3	1	44	54	1.91	+.80	1.78	5	4	.0	0	14.9	SW	•40	ENE	°11	11	9	10	5.3	--
Midland	2854	915.0	1013.0	81	56	68.6	----	94	19	35	1	8	0	45	52	1.39	-----	1.18	4	6	.0	0	7.8	SSE	•33	NE	11	9	9	12	5.8	--
Port Arthur	16	1016.9	1018.2	81	62	71.4	+3.5	85	°12	42	1	0	0	64	81	2.34	-1.60	1.25	7	3	.0	0	12.6	S	49	SE	30	5	13	12	6.5	50
San Angelo	1903	947.2	1013.8	83	59	70.7	+3.3	95	6	34	1	3	0	54	58	3.09	+.90	1.81	8	6	.0	0	----	---	---	---	--	9	7	14	5.5	--
San Antonio	792	987.5	1015.7	84	64	73.7	+4.9	91	15	45	17	2	0	59	66	1.94	-1.08	1.09	6	3	.0	0	10.5	SSE	50	NW	30	5	11	14	6.8	57
Victoria	110	1011.9	1016.3	82	64	73.0	+2.4	87	15	47	°1	0	0	63	74	3.55	+1.11	1.44	8	5	.0	0	13.3	---	•50	W	27	4	12	14	6.9	--
Waco	500	997.3	1015.7	83	61	72.0	+5.2	90	7	37	1	2	0	60	69	2.50	-1.47	1.20	7	6	.0	0	12.3	S	---	---	--	6	10	14	6.1	--
Wichita Falls	1027	977.7	1014.1	80	58	68.6	+6.0	98	6	31	1	1	1	52	62	4.43	+2.08	1.30	8	8	.0	0	11.9	S	•45	S	29	9	8	13	5.6	--
UTAH																																
Milford	5028	845.9	1015.1	70	33	51.6	+3.8	83	°17	22	8	0	15	--	--	.43	-.33	.55	3	1	2.3	2	----	---	---	---	--	12	7	11	5.2	--
Salt Lake City	4222	866.9	1014.6	67	41	53.7	+3.6	79	24	31	7	0	1	30	43	.65	-1.11	.27	4	0	.0	0	10.6	SE	42	SE	28	7	10	13	6.1	73
VERMONT																																
Burlington	331	1005.1	1019.9	54	33	43.4	+1.1	79	22	9	4	0	12	34	71	4.27	+1.64	1.08	16	1	.9	3	11.6	S	49	S	7	3	8	19	7.4	51
VIRGINIA																																
Lynchburg	947	987.8	1021.7	73	48	60.4	+4.9	86	26	30	°4	0	3	46	64	2.22	-.91	1.43	7	4	T	T	9.8	SSW	30	S	°16	7	10	13	5.9	71
Norfolk	26	1021.7	1022.7	72	50	60.8	+4.5	87	°27	33	2	0	0	51	73	2.46	-.70	.63	10	4	T	0	10.3	SW	33	S	17	8	13	9	5.8	59
Richmond	162	1016.3	1022.2	74	48	61.2	+5.1	89	27	28	4	0	3	48	67	3.08	-.15	.98	12	4	T	0	9.6	S	40	NW	8	12	8	10	5.6	68
Roanoke	1174	979.3	1021.7	73	48	60.5	+5.0	86	27	27	2	0	3	44	59	1.08	-1.87	.53	9	5	T	0	10.0	SE	---	---	--	9	9	12	5.8	--
WASHINGTON																																
Olympia	190	1011.9	1019.5	57	35	45.6	-2.8	73	11	26	27	0	10	34	67	4.07	+1.73	.76	13	0	.1	T	8.6	SSW	•26	SSW	8	3	8	19	7.5	--
Seattle CO	14	------	------	55	42	48.7	-3.1	71	11	37	29	0	0	--	--	2.62	+.68	.87	12	0	.0	0	11.7	---	43	SW	1	4	7	19	7.6	40
Seattle	14	1018.7	1019.5	--	--	----	----	--	--	--	--	--	--	37	67	----	-----	----	--	--	----	---	9.3	SSW	---	---	--	--	--	--	---	--
Seattle-Tacoma	379	1005.1	1019.6	54	38	45.6	-3.5	70	11	31	23	0	4	37	74	2.64	+.52	.55	13	1	T	0	12.4	SW	---	---	--	3	7	20	7.9	--
Spokane	2357	946.8	1016.6	54	33	43.5	-2.8	71	16	25	°10	0	14	26	53	.53	-.46	.16	8	0	T	T	10.5	SW	36	SW	1	3	9	18	7.3	61
Stampede Pass CO	3958	878.8	1019.5	37	26	31.8	-5.3	51	16	20	°10	0	28	--	--	8.64	+3.14	1.54	20	0	67.4	163	----	---	---	---	--	2	7	21	8.3	--
Tatoosh CO	101	1015.9	1019.1	49	40	44.5	-3.0	56	11	34	26	0	0	38	78	5.74	+.51	1.98	19	0	T	T	14.7	W	60	SW	5	3	5	22	7.9	41
Walla Walla CO	949	981.7	1017.6	61	43	51.9	-2.0	79	16	34	30	0	0	--	--	1.13	-.11	.47	8	1	.0	0	7.0	---	29	W	3	6	9	15	6.5	59
Walla Walla	1200	------	------	--	--	----	----	--	--	--	--	--	--	34	--	----	-----	----	--	--	----	---	9.7	S	---	---	--	--	--	--	---	--
Yakima	1061	978.0	1017.6	63	32	47.5	-3.9	80	16	23	11	0	18	27	49	.03	-.40	.01	3	0	T	0	10.9	W	---	---	--	6	10	14	6.5	--
WEST VIRGINIA																																
Charleston	950	984.4	1020.0	75	49	62.4	+7.4	90	21	26	2	1	3	45	58	2.55	-1.19	.76	12	5	T	T	9.0	S	•30	WNW	16	6	9	15	6.7	--
Elkins	1970	951.2	1020.8	69	42	55.6	+6.5	83	°21	20	2	0	6	44	--	2.87	-.49	.75	15	6	2.2	2	6.2	SSE	57	W	27	7	9	14	6.8	58
Huntington CO	565	------	------	76	49	62.5	+5.2	90	25	27	2	1	3	--	--	4.04	+.62	.73	14	--	.0	0	----	---	---	---	--	--	--	--	---	--
Parkersburg CO	615	------	------	73	48	60.5	+6.7	88	21	26	1	0	5	--	--	3.64	+.56	1.29	14	5	.8	1	6.3	---	25	NW	16	9	8	13	5.8	60
Parkersburg	837	------	1019.6	--	--	----	----	--	--	--	--	--	--	45	--	----	-----	----	--	--	----	---	9.0	SW	---	---	--	--	--	--	---	--
Petersburg	1013	------	------	73	45	58.7	+6.5	88	20	22	2	0	7	--	--	1.42	-1.41	.48	11	2	.3	T	----	---	---	---	--	9	9	12	5.8	--
WISCONSIN																																
Green Bay	689	994.2	1017.5	56	35	45.0	+3.2	75	10	7	3	0	10	33	67	4.45	+1.94	1.19	11	8	.1	T	11.4	WNW	54	S	7	2	14	14	6.9	51
La Crosse	652	991.5	1016.4	60	39	49.7	+3.1	82	26	10	3	0	8	35	61	6.79	+4.48	3.84	10	7	T	0	13.2	S	•50	SSW	26	5	7	18	7.1	--
Madison	857	981.0	1017.2	61	38	49.4	+3.7	82	26	10	3	0	8	37	67	4.09	+1.60	.84	12	10	T	0	12.5	SE	45	SW	26	5	7	18	7.3	51
Milwaukee	675	992.6	1017.9	57	38	47.6	+3.3	81	26	13	3	0	7	37	69	3.27	+.88	1.22	12	8	T	T	13.1	SW	43	SW	°5	4	6	20	7.5	48
WYOMING																																
Casper	5322	835.1	1012.6	61	33	46.9	+3.9	75	°23	20	29	0	16	24	48	.30	-1.62	.17	7	0	1.7	T	15.8	SW	---	---	--	5	10	15	6.7	--
Cheyenne	6139	810.4	1013.8	61	32	46.4	+5.3	74	23	21	16	0	15	25	46	.40	-1.74	.40	1	0	4.9	5	13.7	WNW	47	N	15	7	9	14	6.1	75
Lander	5563	833.7	1013.7	61	32	46.7	+4.6	74	23	19	30	0	18	22	41	1.06	-1.35	1.24	2	0	14.5	13	9.6	---	51	W	1	6	15	9	5.7	79
Sheridan	3942	882.8	1015.5	57	30	43.5	.0	75	13	15	1	0	18	28	60	1.24	-1.02	.30	10	0	6.8	2	9.7	WNW	47	NW	14	4	9	17	7.0	54
PACIFIC AREA																																
Canton Island	9	1008.5	1008.9	89	78	83.4	-.3	93	15	75	°7	12	0	74	78	1.09	-2.69	.50	5	0	.0	0	----	---	---	---	--	7	14	9	5.7	--
Hilo	31	1014.2	1015.8	81	64	72.7	+1.1	87	28	61	°10	0	0	65	78	3.07	-10.20	1.71	16	0	.0	0	7.5	SW	•30	SE	28	5	10	15	7.1	35
Honolulu	7	1016.3	1016.7	81	68	74.6	+.3	85	8	61	20	0	0	63	70	1.98	+.34	1.56	6	0	.0	0	11.0	NE	31	S	28	7	15	8	5.8	64
Koror CO	94	1006.1	1009.9	89	76	82.2	+.7	93	24	73	°1	13	0	76	81	7.51	-1.27	1.46	20	2	.0	0	4.4	---	23	SE	1	3	12	15	7.0	--
Lihue	115	1011.2	1016.5	79	66	72.6	+.6	82	°10	59	30	0	0	65	77	5.74	+2.71	1.50	10	1	.0	0	9.6	NE	29	S	28	4	10	16	7.3	53
Truk (Moen Island)	8	1009.5	1009.9	86	79	82.4	+1.2	87	°10	74	30	0	0	79	83	9.70	-1.82	2.36	18	0	.0	0	----	---	---	---	--	0	5	25	8.9	--
Ponape CO	112	1005.8	1011.0	86	76	81.1	-.4	90	°24	71	14	2	0	--	--	18.20	-.80	2.59	22	--	.0	0	----	---	---	---	--	--	--	--	---	--
Wake Island	11	1014.9	1015.2	83	73	78.1	-.2	86	10	70	13	0	0	70	77	2.32	+.38	.63	16	1	.0	0	15.2	ENE	---	---	--	8	19	3	5.4	--
Yap CO	53	1006.8	1010.3	89	78	83.1	+.8	91	°26	73	26	8	0	75	78	2.01	-3.74	.49	15	0	.0	0	----	---	---	---	--	0	11	19	7.7	--
WEST INDIES																																
San Juan, P.R. CO	47	------	------	81	72	76.1	-.5	88	28	68	22	0	0	--	--	2.24	-1.56	.65	20	3	.0	0	----	---	---	---	--	--	--	--	---	--
San Juan, P.R.	9	1014.9	1016.8	83	71	76.9	-.1	89	28	67	22	0	0	67	73	2.40	-2.05	.51	18	3	.0	0	13.7	E	32	E	7	3	15	12	6.4	81
ALASKA																																
Anchorage	92	1010.2	1015.3	43	23	33.3	-2.1	52	28	10	10	0	27	20	57	.03	-.37	.03	1	0	.7	11	5.9	WNW	•32	NNE	°5	15	10	5	4.4	84
Annette Island	110	1011.9	1015.9	43	32	37.6	-5.0	50	22	21	3	0	16	26	67	7.99	-.14	1.51	14	0	5.0	T	14.1	SSE	•44	SSE	15	10	2	18	6.2	--
Barrow	22	1024.4	1025.1	12	-6	2.7	+2.9	35	30	-24	17	0	30	-2	76	.06	-.04	.04	3	0	.7	17	8.3	---	24	SE	23	7	10	13	6.4	--
Bethel	21	1017.6	1019.0	38	17	27.5	+.7	49	22	2	10	0	30	22	80	.18	-.37	.10	4	0	.8	5	11.4	NNW	•27	SSE	28	11	7	12	5.3	--
Cordova	40	1012.9	1014.6	43	21	31.7	-4.7	48	°2	4	°7	0	29	23	68	.28	-4.79	.27	3	0	1.7	16	2.9	E	•18	NNW	6	10	8	12	5.6	--
Fairbanks	436	1001.4	1019.1	38	15	26.4	-2.5	51	28	-9	6	0	30	12	53	T	-.29	T	0	0	.1	7	6.0	N	25	NE	8	10	10	10	5.6	--
Juneau	15	1015.2	1015.9	41	26	33.1	-6.4	51	19	15	4	0	25	22	65	1.95	-1.03	.78	10	0	9.5	8	7.6	ESE	50	SE	16	10	3	17	6.6	59
Kotzebue	10	1022.0	1022.8	25	3	13.8	.0	38	28	-16	17	0	30	9	81	.14	-.22	.12	3	0	.3	12	10.6	ESE	•34	ESE	28	13	9	8	4.7	--
McGrath	334	1005.4	1018.5	38	15	26.7	+.7	52	23	-7	10	0	30	19	68	.29	-.20	.2[illegible]	4	0	.3	17	5.1	N	•19	NNW	4	10	11	9	5.0	--
Nome	13	1020.7	1021.5	29	10	19.6	-1.4	36	4	-4	17	0	30	15	80	.41	-.37	.28	5	0	2.0	10	6.3	E	34	SE	28	15	6	[illegible]	4.3	64
Northway	1713	952.6	1017.8	33	7	20.3	-5.5	46	30	-31	7	0	30	11	63	.14	-.21	.10	3	0	3.4	9	6.0	NW	•23	NW	4	3	11	16	7.0	--
St. Paul Island	22	1019.6	1020.8	33	24	28.3	-1.8	40	6	12	14	0	30	25	86	.81	-.21	.42	10	0	2.6	8	----	---	---	---	--	8	6	16	6.4	--
Yakutat	28	1013.5	1014.8	40	21	30.7	-5.8	49	21	5	7	0	29	24	72	2.48	-5.50	1.0[illegible]	10	0	10.9	21	5.7	ESE	•20	ESE	°9	11	5	14	6.[illegible]	--

Data from airport unless otherwise specified. CO indicates data from city office.

• Data entered in column "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.

° Other dates also.

% Peak gust.

* Max. 70°F. or above for Alaskan Stations.

a Maximum hourly average.

HEATING DEGREE DAYS

(Base 65°F.)

Table 3

APRIL 1954

State and station	Current season		Normals July through this month
	This month	Period July through this month	
ALABAMA			
Birmingham	55	2543	2750
Mobile	18	1551	1612
Montgomery (CO)	30	1865	1954
Montgomery	29	2025	2137
ARIZONA			
Flagstaff	552	6397	6848
Phoenix (CO)	3	1111	1492
Phoenix	7	1361	1698
Prescott	231	3913	4352
Tucson	5	1344	1776
Winslow	174	4274	4550
Yuma	0	743	951
ARKANSAS			
Ft. Smith	54	3080	3164
Little Rock	51	2732	2964
Texarkana	32	2288	2362
CALIFORNIA			
Bakersfield	54	2088	2094
Bishop	191	3833	4044
Blue Canyon	457	4691	5120
Burbank	127	1361	1701
Eureka (CO)	435	3839	3975
Fresno	98	2487	2489
Los Angeles (CO)	120	1055	1364
Los Angeles	170	1416	1833
Mt. Shasta (CO)	459	4938	5382
Oakland	193	2524	2832
Red Bluff	129	2407	2495
Sacramento (CO)	126	2360	2510
Sacramento	140	2537	2712
Sandberg (CO)	317	3741	3926
San Diego	116	1103	1434
San Francisco (CO)	232	2487	2641
San Francisco	244	2761	2993
San Jose	139	2086	2227
Santa Maria	249	2384	2553
COLORADO			
Alamosa	539	7437	8016
Colorado Springs	383	5191	5872
Denver	333	4776	5781
Grand Junction	248	4833	5628
Pueblo	246	4496	5479
CONNECTICUT			
Bridgeport	436	4795	5609
Hartford	446	5198	5907
New Haven	484	5129	5713
DELAWARE			
Wilmington	289	4403	4794
DIST. OF COLUMBIA			
Washington (CO)	191	3645	4178
Washington	198	3723	4246
FLORIDA			
Apalachicola (CO)	5	1163	1307
Daytona Beach	3	730	868
Fort Myers	0	360	405
Jacksonville (CO)	8	988	1113
Jacksonville	13	1117	1243
Key West (CO)	0	39	77
Miami (CO)	0	163	173
Int. Airport, Hialeah	0	144	178
Miami Beach	0	80	123
Orlando	0	612	650
Pensacola (CO)	9	1339	1435
Tallahassee	9	1378	1519
Tampa	0	530	674
West Palm Beach	0	220	248
GEORGIA			
Albany	10	1606	1763
Athens	71	2617	2785
Atlanta (CO)	70	2583	2787
Atlanta	65	2585	2806
Augusta	56	2291	2138
Columbus	35	2179	2396
Macon	36	1984	2049
Rome	78	3051	3111
Savannah	29	1693	1710
Valdosta	13	1409	1525
IDAHO			
Boise	447	4929	5549
Lewiston	461	4754	5193
Pocatello	508	5725	6523
ILLINOIS			
Cairo (CO)	100	3391	3709
Chicago (CO)	379	4966	
Chicago	354	5090	6023
Chicago University	392	5043	
Moline	355	5488	6120
Peoria	304	5131	5854
Springfield (CO)	220	4406	5084
Springfield	255	4762	5490
INDIANA			
Evansville	165	4036	4264
Ft. Wayne	346	5244	6008
Indianapolis (CO)	237	4456	4978
Indianapolis	261	4762	5405
South Bend	407	5534	6214
INDIANA (Cont'd.)			
Terre Haute	238	4660	5197
IOWA			
Burlington	324	5230	5888
Des Moines	352	5568	6200
Dubuque	452	6208	6928
Keokuk (CO)	238		
Sioux City	416	5991	6730
KANSAS			
Concordia (CO)	227	4543	5157
Dodge City	226	4330	4908
Goodland	344	5297	6068
Topeka (CO)	171	4200	4794
Topeka	178	4350	5057
Wichita	139	4000	4463
KENTUCKY			
Lexington	177	4044	4824
Louisville (CO)	153	3666	4193
Louisville	163	3911	4340
Pikeville (CO)	137	3523	
LOUISIANA			
Baton Rouge	17	1469	1595
Lake Charles	12	1340	1543
New Orleans (CO)	8	1079	1175
New Orleans	5	1158	
Int.Airport,Moisant	12	1304	1317
Shreveport	27	2009	2117
MAINE			
Caribou	877	8579	9460
Greenville (CO)	816	7968	
Portland	654	6596	7170
MARYLAND			
Baltimore (CO)	185	3524	4130
Baltimore	243	4247	4514
Frederick	265	4705	4748
MASSACHUSETTS			
Blue Hill Obs.	543	5552	
Boston	442	4919	5513
Nantucket	599	4973	5569
Pittsfield	570	6600	7253
MICHIGAN			
Alpena (CO)	714	6830	7501
Detroit	442	5428	6093
Escanaba (CO)	748	7138	8020
Grand Rapids (CO)	443	5519	6168
Grand Rapids	471	5883	6695
Lansing	489	6020	6625
Marquette (CO)	754	7100	7863
Muskegon	514	5893	6623
Sault Ste. Marie	841	7998	8752
Ypsilanti	431	5539	
MINNESOTA			
Duluth (CO)	834	8020	8887
Duluth	842	8618	9285
International Falls	919	9491	9992
Minneapolis	553	6829	7514
Rochester	530	6945	7705
St. Cloud	685	7906	8456
MISSISSIPPI			
Jackson	33	2081	2202
Meridian	37	2226	2324
Vicksburg (CO)	25	1898	2000
MISSOURI			
Columbia	185	4247	4964
Kansas City	172	4107	4769
St. Joseph	222	4665	5195
St. Louis (CO)	155	3764	4368
St. Louis	162	3991	4587
Springfield	125	3947	4559
MONTANA			
Billings	661	6044	6683
Glasgow (CO)	789	7528	8265
Great Falls	835	6559	7030
Havre (CO)	825	7213	7775
Helena	746	6783	7654
Kalispell	755	7063	7449
Miles City	675	6665	7431
Missoula	665	6535	7332
NEBRASKA			
Grand Island	364	5498	6077
Lincoln (CO)	304	5089	5661
Lincoln	334	5237	5876
Norfolk	425	6051	6754
North Platte	414	5767	6244
Omaha	309	5177	5953
Scottsbluff	446	5590	6455
Valentine (CO)	497	5864	6704
NEVADA			
Elko	537	6374	6774
Ely	560	6469	6825
Las Vegas	15	2349	2425
Reno	432	5163	5553
Tonopah	341	4865	5450
Winnemucca	462	5527	5959
NEW HAMPSHIRE			
Concord	579	6419	7214
Mt. Washington	1222	11795	
NEW JERSEY			
Atlantic City (CO)	401	4038	4528
Newark	358	4441	5093
Trenton (CO)	322	4332	4924
NEW MEXICO			
Albuquerque	96	3726	4319
Clayton	250	4378	4930
Roswell	63	3129	3396
NEW YORK			
Albany	498	6039	6666
Binghamton	537	6373	7131
Buffalo	524	5725	6451
New York (CO)	360	4224	4879
La Guardia Field	327	4086	4838
Rochester	534	5899	6520
Schenectady	576	5811	
Syracuse	503	5828	6236
NORTH CAROLINA			
Asheville (CO)	136	3680	3962
Asheville	181	4103	
Charlotte	112	2897	3176
Greensboro	150	3454	3760
Hatteras (CO)	97	2104	2367
Raleigh (CO)	110	2858	3046
Raleigh	122	3074	3328
Wilmington	79	2183	2316
Winston-Salem	140	3231	3672
NORTH DAKOTA			
Bismarck	726	7628	8562
Devils Lake (CO)	818	8564	9409
Fargo	711	8132	8835
Grand Forks	787	8570	
Pembina	804	8667	
Williston (CO)	803	7749	8570
OHIO			
Akron	356	5488	5918
Cincinnati (CO)	164	3846	4424
Cincinnati	210	4386	5023
Cleveland (CO)	341	4789	5445
Cleveland	327	5055	5737
Columbus	261	4760	5404
Dayton	278	4776	5379
Sandusky (CO)	337	4883	5601
Toledo	393	5364	6089
Youngstown	375	5552	5878
OKLAHOMA			
Oklahoma City	79	3201	3604
Tulsa	60	3122	3540
OREGON			
Astoria	548	4350	
Burns (CO)	553	5790	6410
Eugene	452	4178	4384
Meacham	736	6428	7034
Medford	351	4079	4271
Pendleton	454	4639	4956
Portland (CO)	405	3676	3874
Portland	456	4151	4297
Roseburg	413	3873	
Salem	478	4255	4234
Sexton Summit (CO)	577	5294	5497
PENNSYLVANIA			
Allentown	374	5135	5691
Harrisburg	295	4616	5116
Park Place (CO)	525	6182	6800
Philadelphia (CO)	288	3896	4430
Philadelphia	278	4201	4762
Pittsburgh (CO)	238	4332	4898
Pittsburgh	295	5008	5674
Reading (CO)	281	4346	4926
Scranton (CO)	391	5238	5816
Williamsport	382	5292	5692
RHODE ISLAND			
Block Island	553	4749	5412
Providence	459	5179	5809
SOUTH CAROLINA			
Charleston (CO)	29	1586	1769
Charleston	43	1893	1973
Columbia (CO)	47	2066	2284
Columbia	63	2326	2435
Florence	59	2185	2507
Greenville	89	2745	3028
Spartanburg	101	2812	3018
SOUTH DAKOTA			
Huron	546	6963	7543
Pierre	555	6431	
Rapid City	565	5929	7030
Sioux Falls	499	6880	7492
TENNESSEE			
Bristol	140	3819	4053
Chattanooga	59	3071	3339
Knoxville	80	3277	3540
Memphis	68	2834	3113
Nashville	91	3284	3470
TEXAS			
Abilene	30	2281	2657
Amarillo	147	3543	4246
Austin	13	1586	1713
Brownsville	5	491	617
Corpus Christi	7	760	1011
Dallas	26	2111	2272
Del Rio	3	1386	1407
El Paso	17	2421	2641
Ft. Worth	28	2195	2356
Galveston (CO)	10	1015	1211
Galveston	11	1061	1233
Houston (CO)	8	1106	1276
Houston	10	1228	1388
Laredo	1	789	781
Lubbock	97	3209	3551
Midland	48	2296	
Port Arthur	15	1374	1517
San Angelo	23	2092	2107
San Antonio	8	1370	1579
Victoria	7	1042	1126
Waco	22	1927	2025
Wichita Falls	45	2524	3009
UTAH			
Milford	398	5633	6099
Salt Lake City (CO)	293	4524	5191
Salt Lake City	335	4907	5552
VERMONT			
Burlington	644	6845	7486
VIRGINIA			
Lynchburg	182	3715	4066
Norfolk	175	2996	3395
Richmond	183	3480	3889
Roanoke	176	3711	4071
WASHINGTON			
Olympia	578	4968	4980
Seattle (CO)	482	3963	4085
Seattle-Tacoma	575	4774	4813
Spokane	640	5907	6376
Stampede Pass (CO)	988	8103	8075
Tatoosh Island (CO)	607	4810	4957
Walla Walla (CO)	387	4192	4639
Yakima	518	5409	5587
WEST VIRGINIA			
Charleston	165	3909	4299
Elkins	285	5288	5496
Huntington (CO)	161	3779	3983
Parkersburg (CO)	193	4178	4618
Petersburg (CO)	227	4387	4819
WISCONSIN			
Green Bay	592	6864	7805
La Crosse	463	6312	7326
Madison (CO)	466	6110	6955
Madison	463	6136	7063
Milwaukee	516	5949	6745
WYOMING			
Casper	536	6254	7111
Cheyenne	550	6000	6927
Lander	539	6350	7744
Rock Springs (CO)	522	6340	
Sheridan	640	6382	7355
ALASKA			
Anchorage	945	10239	9852
Annette Island	814	6367	6279
Barrow	1870	18293	17629
Bethel	1119	12373	11733
Cordova	990	8725	8459
Fairbanks	1151	13856	13419
Juneau	952	8163	7988
Kotzebue	1528	14428	14403
McGrath	1144	13850	13431
Nome	1354	12902	12540
Northway	1336	15422	14568
St. Paul	1094	9866	9210
Yakutat	1022	8455	8216

Data from airport unless otherwise specified.
CO indicates data from city office.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Illinois, south-central and northeastern portions	1	2-3 a.m.	*15-25				$10,000		Wind	Damaging windsqualls extended from southern Macoupin County to Coles County and also locally in northeastern Illinois.
Wallace (12 miles south of), Idaho	1				1				Snowslide	Man killed in snowslide.
Miami, Fla.	3	Afternoon			0	0	0	$0	Tornado and waterspout	Associated with thunderstorm. Cloud formed over runways of Marine Air Station and surface winds gave field a good sweeping. Waterspout associated with same thunderstorm moved in from Atlantic, but dissipated quickly on reaching land, causing no damage. Winds not much stronger than in "dust devil".
Pompano Beach, Fla.	3	Afternoon			0	0	0	0	Tornado	Tornado cloud observed west of Pompano Beach, but apparently never reached surface.
Broward County, Fla.	3	3 p.m.						50,000	Hail and wind	Hail covered ground and drifted to depth of a foot in spots. Stones up to hen-egg size. Beans, peppers, peas, and corn on 1,000 acre farm near Pompano Beach lost, due to hail. Strong winds knocked down TV antennas, bent flag poles, and injured shrubbery in eastern portion of County.
Albemarle County and vicinity, Va.	4	A.m.						250,000	Frost	Peach orchard damage.
Mexico and Benton City, Audrain County, Mo.	5	1:30-2 a.m.	*3		0	0	5,000	1,000	Tornado or winds	1 house destroyed, several outbuildings destroyed or damaged. Extensive damage to small fruit trees and crops. Power lines inoperative for several hours. Some farm equipment damaged.
Crawfordsville, Montgomery County, Ind.	5	A.m.	*2	15			16,000		Electrical and hail	Lightning destroyed 3 barns. Hail damaged some roofs, with losses of about $1,000; maximum hail 2 inches in diameter.
Jamestown (3 miles southwest of), Hendricks County, Ind.	5	A.m.					3,000		Electrical	Barn destroyed by lightning.
Ashford (near) Houston County, Ala.	5	1:30 p.m.					3,000		Wind	1 barn and 1 dwelling destroyed; trees uprooted and utility lines blown down.
Between Princeton and Oakland City, Gibson County, Ind.	5	Afternoon					5,500		do	11 power line poles blown down. Also barn 5 miles southwest of Owensville demolished.
Rush County, Ind.	5						15,000		Electrical and hail	Lightning set fire to barn, destroying 70 hogs, automobile, etc. Hail accompanied thunderstorm. Maximum hail 1 inch in diameter.
New Harmony, Posey County, Ind.	5	2 p.m.					2,000		Wind	House unroofed. Several TV antennas down.
Oldham and Jefferson Counties, Ky.	5	2:35 p.m.					10,000		Wind, rain, and hail	Storm ripped off roofs, razed trees, and damaged numerous buildings. Winds estimated at 50 to 60 m.p.h. Heavy rain and some hail accompanied wind. Greatest damage at La Grange.
Washington, Daviess County, Ind.	5	3 p.m.					5,000		Hail	Very large hail damaged roofs and windows.
Omaha (northern and central portions), Nebr.	5	3 p.m.	*2-3	4-5			3,000	Little	do	Most damage to cars, greenhouses, and tied-down planes.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Council Bluffs, Iowa	5	3:25-3:31 p.m.	*3	12			$800,000		Hail	Stones averaged ½ inch, but with many size of golf balls and a few size of baseballs. Greatest damage to greenhouses.
Paul (near), Nebr.	5	4-4:20 p.m.	*8	15	0	0	5,000	$50,000	Hail and tornado	Most damage to winter wheat, cars, and greenhouses. Several people reported seeing funnel-shaped cloud which did not reach ground.
Bloomington, Monroe County, Ind.	5	4:30 p.m.					1,800		Hail	Hail severely damaged wings and fuselage of 2 aircraft at airport.
Carroll, Iowa	5	4:30-4:40 p.m.							do	Extensive damage to greenhouses. A few hailstones as large as baseballs reported.
Westboro (2 ½ miles north of), Atchison County, Mo.	5	5-5:10 p.m.	5-900	5	0	2	131,500	18,500	Tornado	4 homes destroyed and 4 damaged; 25 outbuildings destroyed and 40 damaged. Crops and small trees uprooted; up to 2 inches of topsoil removed along tornado path. Direction of storm northeastward. 2 funnels seen in close proximity at time of strike.
Greene County (western portion), Iowa	5	5:10 p.m.	*½	7	0	1	100,000	0	do	Path from 1/4 mile east of Scranton to 2 miles northwest of Farlin. Funnel cloud observed. Severe damage to 5 homesteads. Major damage on 13 other farmsteads.
Page and Taylor Counties (southern portions), Iowa	5	5:30-6:45 p.m.	*1/4-1/2		0	2	318,000	0	Tornadoes	Family of 4 tornadoes. (1) 5 miles long from 2½ miles north of Westboro, Mo., to ½ mile southeast of Northboro. (2) Short, 3 miles east-southeast of Northboro. (3) Intermittent beginning at Elmo, Mo., to 2 miles north of Siam, continuing 5 miles into east Mason Township. (4) Short, ½ mile north of Bedford. As many as 6 funnel clouds observed. Reports indicate 6 homesteads completely demolished; homes damaged and barns or other buildings demolished on 20 farmsteads; relatively minor damage on 28 other farmsteads.
Hopkins, Nodaway County, Mo.	5	5:30-7 p.m.					35,000	5,000	Hail	Most hail size of walnuts, with largest size of baseballs, covered ground completely. Damage confined to roofs, autos, equipment, and windows.
Milford-Riley area, Geary and Riley Counties, Kans.	5	6:45 p.m.		9	0	0		0	Tornadoes, hail, and rain	2 funnels observed from Milford, at least 1 dipping to ground and damaging 1 farmstead on edge of Milford, and several in Riley area to northeast. Hailstones up to 2 inches in diameter and a little rain fell at time of and following first funnel. Storm moved north-northeastward.
Marshall County, Iowa	5	7:15-8 p.m.					15,000		Wind	Buildings on 3 farmsteads about 7 miles west of Marshalltown damaged.
Soldier (10 miles south of), Jackson County, Kans.	5	7:30 p.m.	100	5	0	0	5,000	0	Tornado	Definite path of tree and building damage through rural area. Storm moved east-southeastward.
Mahaska County, Iowa	5	8:30 p.m.					10,500		Wind	Large home in Beacon unroofed. Large barn and 4 small buildings north and northeast of Oskaloosa destroyed.
New Holstein (near), Wis.	5	11 p.m.					5,000		Wind and rain	Wind blew down 90-foot barn 2½ miles north of New Holstein. Machinery blown into farmyard with considerable damage ensuing. Granary partially destroyed. No cattle killed, although herd in barn at time of windstorm.
Ridgway, Pa.	6	12:30 a.m.					2,000		Electrical	Lightning struck masonic building, causing damage to coping and roof.
Illinois, middle and southern portions	6	1-2:30 a.m.					10,000		Wind	Major damage to grain storage bins northwest of Kinderhook in Pike County. Wind damage also reported from Allerton and Altamont in central Illinois and from Mt. Vernon and Johnston City in southern Illinois.
Coatesville, Pa.	6	Early morning					25,000		Electrical	Lightning struck and fired church.
Schwenksville (near), Pa.	6	3:10 a.m.					14,000		do	Tremendous lightning bolt seemed to strike several places simultaneously. Resulting fire in 3-story home caused $4,000 damage; resulting fire in newspaper plant caused $10,000 damage.
Wheatland, Knox County, Ind.	6	A.m.	25		0	0	4,000	0	Tornado	Winds from twister unroofed 2 or 3 buildings, dropping roof of 1 on truck and damaging it.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Glezen (5 miles south of Petersburg), Pike County, Ind	6	5 a.m.			0	1	$5,000	$0	Tornado and hail	Tornado damaged store roof; also 2 houses, carrying away 2 porches and much of roof from 1. 2 barns also damaged. Hail broke a few windows. Maximum hail 1 inch in diameter.
Ferdinand, Dubois County, Ind.	6	7 a.m.		4	0	0	8,000	0	Tornado	Roofs of church and several homes damaged. 2 garages and 2 barns also damaged. Moved northeastward.
Petersburg, Pike County, Ind.	6	P.m.			0	0	800	0	do	Poultry house destroyed.
Sheridan, Hamilton County, Ind.	6						15,500		Electrical	Large barn containing stored grain destroyed.
Clarksville, Habersham County, Ga.	6	Evening							Hail	Considerable property damage.
Colorado, northeastern portion	6	Night	*75	100		1	1,500		Wind and dust	Several automobile accidents caused by limited visibility.
Iowa County, Wis.	7	5:45 a.m.	400	6-8	0	4	60,000	300	Tornado and rain	Tornado passed through northwestern Iowa County on line 6 miles north of Highland proper, northeastward to 3 miles southeast of Avoca during early morning, accompanied by hard rain. Winds estimated as high as 100 m.p.h. 1 farm home destroyed, 7 others damaged. 13 farm buildings destroyed and 37 damaged. 1 cow killed.
Dane, Rock, and Jefferson Counties, Wis.	7	A.m.-p.m.				1	38,500	0	Wind, hail and rain	Strong winds throughout day, gusts of 45 m.p.h. recorded at Madison, higher in local areas. Six 80-foot steel towers of Power and Light Company, buckled due to high winds in Beloit-Janesville area; damage $15,000. Several roofs blown off homes and apartments. Hail heavy in local areas; at Verona diameter 1½ inches, in Lake Mills area 2 to 3 inches, and at Milford as big as baseballs. Damage at 1 farm site near Milford $20,000, due to hail.
Fond Du Lac County, Wis.	7	Morning and early afternoon			0	0	30,000	0	Wind, hail, and rain (possible tornado).	Severe thunderstorm centered over Mt. Calvary in Fond du Lac County at mid-morning and moved slowly eastward. 2 farms east of Mt. Calvary hit very hard as well as residences in Mt. Calvary. 60x40-foot barn demolished, killing 5 cattle. 140-foot long roof on adjacent farm loosened from its moorings. 400-pound concrete silo roof lifted off silo and placed on ground. Hailstones as big as golf balls at Mt. Calvary. School, home, and greenhouse windows demolished. A few TV towers blown down.
Minnesota, east-central and southeastern counties	7	A.m.					15,000		Electrical, rains, hail, and wind	Farm home near Carlton and barn on farm 7 miles southeast of Austin destroyed by fire after being struck by lightning, in which 3 farm animals perished. Also, a number of other places struck by lightning, but damage minor. Additional minor damage from locally heavy rains, hail, and wind which accompanied storm.
Oconomowoc, Wis.	7	1:15 p.m.			0	0	50,000	0	Wind, hail, and rain (possible tornado).	Thunderstorm with strong wind, heavy rain, and pea-size hail moved through downtown Oconomowoc from southwest then northeast. Several roofs of buildings torn loose, plate-glass windows broken, trees snapped, and TV antennas torn down. 13 business establishments received damages.
Livingston and Kankakee Counties, Ill.	7	3-3:50 p.m.	*1/4	45	1	13	246,000		Tornado and wind	Tornado first touched ground near Saunemin in Livingston County about 3 p.m. then lifted, but touched ground again in southwestern Kankakee, moved northeastward across village of Indian Oaks for distance of 15 miles. 8 homes destroyed, 30 damaged, 30 other buildings destroyed and 46 damaged. "Bell-shaped" funnel cloud observed. Severe windsqualls also occurred near Pekin and Mattoon.
Grand Rapids, Mich.	7						1,000		Electrical	Lightning struck house, resulting in attic fire.
Flint and Genesee Counties, Mich.	7	P.m.					1,000,000		Wind	Severe thunderstorms levelled 3 garages, damaging 1 car. High winds broke shingles of many roofs. Damage to television antennas nearly $1,000,000.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Royal Oak, Mich.	7	P.m.					$2,500		Electrical	Lightning struck house and damaged several rooms. Minor damage at several other places.
Wanamaker, Marion County, Ind.	7	P.m.					6,000		do	Barn destroyed.
Johnson, Parker, and Somervell Counties, Tex.	7	5 p.m.	*3		0	0	750,000	$0	Wind, hail, and tornado	Storm moved southward; covered approximately 100 square miles from Weatherford south to Glenrose and northeast to Cresson. Largest hail size of baseballs; average, size of hens' eggs. 1,000 automobiles and 2,000 homes heavily damaged. Roof lifted from fine ranch home. Unconfirmed tornado sighted at Cresson at 5:45 p.m., moving southeastward.
Kendallville, Noble County, Ind.	7	5:50 p.m.			0	0	30,000	0	Tornado and hail	Barns, outbuildings, and trees flattened. Livestock and chickens killed. Tornado sounded like "swarm of bees". Accompanied by hail.
Albion (4 miles northeast of), Noble County, Ind.	7	6 p.m.	400	½	0	0	3,400	0	Tornado and wind	High wind, small tornado, but not much damage reported. Funnel observed by 1 person.
Boone and McHenry Counties, Ill.	7	6:40-7:15 a.m. 1:30-1:40 p.m.					10,000		Hail and rains	In Belvidere 60 percent of all greenhouse glass broken in afternoon hailstorm when stones size of golf balls reported. Heavy rains flooded farm homes north of Marengo.
Fulton, Mich.	7	7-7:08 p.m.	33		0	0	8,500	0	Tornado and hail	The observed tornado cloud, moving generally eastward, flattened 2 barns, tore roof from apartment house, damaged several other buildings, and blew out windows. Some destruction occurred in country. Hail fell which measured up to 1 inch in diameter.
Commerce and Ladonia, Hunt County, Tex.	7	7:15 p.m.	*1	12			1,000		Wind	Traveled southeastward. Damage to buildings.
Atkins, Pope County, Ark.	7	9 p.m.							Wind and electrical	Extensive damage to roofs, shade trees, power and telephone lines. 1 house destroyed by fire after being struck by lightning.
Tyler, Smith County, Tex.	7	11:40 p.m.							Electrical	Lightning started fire in furniture repair shop. Extent of loss undetermined.
Warren, Pa.	8	2:30 a.m.							do	Surge from power lines, following lightning strike, damaged diesel railroad engine, $500. Radio station antenna also damaged during same storm.
Battle Creek, Mich.	8	10 a.m.			0	0	0	0	Tornado	Tornado cloud aloft sighted by airline pilot 10 miles northwest of Battle Creek.
Henderson County, N. C.	8	1:30 p.m.	*3	10			27,500	1,000	Rain and hail	Rainfall of 2.35 inches in an hour at Asheville-Hendersonville Airport. Considerable soil erosion; some upstream flooding. Hail damage to crops.
Iowa (2 miles south of), Jefferson Davis Parish, La.	8	3 p.m.	10	1	0	0	0	0	Tornado	Funnel observed to dip to ground in rice field. Storm moved northeastward.
Wrens, Jeff Davis County, Ga.	8	Afternoon							Electrical	Lightning struck barbed wire fence, killing 10 cows and 2 goats.
Dawson County (southwestern section), Ga.	8	4 p.m.	200	5½	0	0	8,000	17,000	Tornado	Storm moved eastward. Sharply defined path. Crop damage to standing timber.
Queen Annes and Caroline Counties, Md.	8	P.m.						Minor	Thunderstorm	Numerous buildings damaged.
Swartz Creek, Mich.	8	7:15-7:40 p.m.			0	2		0	Tornado, wind, and hail	Up to 7 pendant clouds observed from same cloud mass; 1 dipped to ground, destroying 2 barns and damaging 2 fire engines and 2 autos. Garage roof carried 100 yards. High winds blew in store windows. Loss at 1 store $5,000. Hail size of golf balls. Television antennas blown down and utility services interrupted.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Shaw Field, S. C.	9	Afternoon					$1,000		Wind	Glass blown out of 1 building. 2 helicopters struck by flying debris, with some damage resulting. Greyhound bus picked up and blown off highway near Shaw Field. Gusts up to 78 m.p.h. recorded at east end of field. Other areas reported fairly high winds, with but negligible damage.
Tuckerton, Ocean County, N. J.	9	2 p.m.	100	500			1,000		do	Chicken coop demolished, killing 200 chickens. Owner reported dark funnel-shaped cloud passed over area at time of damage.
Bordentown (near), Burlington County, N. J.	9	P.m.					1,000		do	Large roof blown from warehouse.
Between Welsh and Jennings, Jefferson Davis Parish, La.	9	4:10 p.m.	20	3	0	0	0	Slight	Tornado	Funnel photographed; plowed up ground across rice farm. Moved northeastward.
North Dakota, throughout State	10						2,000		Dust and winds	Duststorm rather general. Isolated reports of damage to buildings from high winds. Barn wrecked on a farm near Tokio. New sports arena building under construction in Crosby damaged by wind so it had to be started all over again. Little damage to crops.
Copiah County, Miss.	10						Slight	$75,000	Hail	Cabbage crops destroyed.
Chillicothe, Livingston County, Mo.	10						30,000		Electrical	Lightning struck industrial building; fire damages included contents of building.
Bradley County, Ark.	10	12:30-1:25 p.m.	100	21	0	0	15,000	0	Tornado	Scattered damage over narrow path between Hermitage and Warren. Funnel cloud observed by several persons at Hermitage.
Crossett (near), Ashley County, Ark.	10	4:30 p.m.			0	0	3,000	0	do	Damage to 1 farmstead.
Winfield and vicinity, Cowley County, Kans.	10	5:30 p.m.	*3	10			11,500	5,000	Hail and wind	Severe hail at Winfield and surrounding rural areas, particularly east and south; damage to greenhouse, neon signs, and roads. Area of wind damage 300 yards by 100 yards 6 miles southeast of Winfield. Property damage from wind $1,500, from hail $10,000. Crop damage from hail, $5,000. Storm moved southeastward.
Waverly (5½ miles southeast of), Coffey County, Kans.	10	6:30 p.m.	7 to 33		0	0	2,375	0	Tornado (probable), hail and rain	Sudden windstorm, probably small tornado, wrecked barns and sheds on 2 farms. About 1-1/4 inches of rain and 1 inch hail fell in 3 minutes. Damage from wind $2,200; from hail $175. Storm moved northward.
Hollis, Harmon County, Okla.	10	7:50-8:20 p.m.	Narrow	Short			3,500		Hail	Hail 3/4 inch in diameter covered ground 33 to 50 percent. Damaged roofs and windows.
Greer County, Okla.	10	8:09-8:45 p.m.	440	3			5,000		do	Path east-northeastward 5 to 7 miles south of Mangum. Hail 1½ to 3 inches in diameter covered 80 percent of ground. 2 farm houses suffered damage.
Coffeyville (near), Montgomery County, Kans.	11	Early a.m.					1,800		Electrical	Barn and contents burned.
Lovington, N. M.	11	2 p.m.					120,000	10,000	Rain and hail	Considerable livestock killed by hail, with hailstones reported up to 7-3/4 inches in circumference. Heavy damage to roofs, windows, cars, and neon signs. Considerable damage from flooding of stores and homes.
Red Bluff Dam, Reeves County, Tex.	11	4:41 p.m.			0	0	0	0	Tornado	Pilot reported twister-type cloud extending to ground, 1 mile in diameter, and centered 10 miles east of north tip of Red Bluff Reservoir; movement unknown. Cloud dissipated before causing any damage. Sparsely settled section.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Wink, Winkler County, Tex.	11	7:30 p.m.					$500		Wind and hail	Property damage in every section of Wink. 3 or more small buildings blown away; TV antennas wrecked. Chevrolet company unroofed. 95 percent wind, 5 percent hail damage. Hail small, but heavy.
Phenix City (11 miles south of), Ala.	13	5:30 p.m.					2,000		Winds	Destroyed 4 outbuildings and damaged several dwellings
Bonifay, Holmes County, Fla.	13	6:30 p.m.						$0	Wind	Wind estimated at 75 m.p.h. from north smashed plate-glass window, tore porch roof from home, twisted TV aerials, and uprooted few trees.
Brownsville, Edmonson County, Ky.	14	P.m.					1,000		Electrical	Lightning struck barn and killed 2 work mules and caused considerable damage to barn. Home also hit.
Gordon County (southern portion), Ga.	14	9 p.m.	1,000	2			1,200		Wind and hail	Damage to fruit trees, gardens, barns, and roofs of homes. Residents estimated 2 inches of hail fell in 15 minutes.
Wisconsin, northwestern counties	14-15	P.m.-a.m.							Rain, hail, and wind	Severe thunderstorms brought heavy rains, hail, and wind. Flash floods in small streams. Heaviest flood damage on Eau Galle and Red Cedar Rivers. Part of 120-foot dam near Lake Eau Galle at Eau Galle washed out, first time since 1934. Estimated damage at Spring Valley due to flooding $20,000. Streets and sidewalks washed out at Glenwood City. Numerous railroad bridge approaches washed out, halting train traffic in many areas until afternoon of 15th. In Eau Claire-Boyceville area heavy hail fell; stones as large as walnuts did considerable damage. Thousands of wild ducks, geese, and swans forced down and many killed due to hail. Average size of hail 1 to 2 inches.
Stillwater and vicinity, Minn.	15	A.m.					2,000		Electrical	Farm home partially destroyed by fire after being struck by lightning.
Trout Creek Community (6 miles southeast of Kirbyville), Newton County, Tex.	15	9 a.m.	200	½	0	0	1,000		Tornado	Advanced northeastward. House moved from foundation; power lines disrupted; 3- and 4-foot trees snapped.
Cypress and Fairbanks, Harris County, Tex.	15	Noon			0	0			do	Barn unroofed; carbon plant roof damaged. Support-posts to porch of home knocked out. Touched ground twice.
South Dakota, except extreme southeast portion	15								Dust and winds	Strong winds out of north, reaching speeds 40 to 60 m.p.h., general over most of State for 10 to 13 hours. Much soil blowing, particularly in north-central, northwest, and south-central counties. Visibilities reduced to ½ to 2 miles at times from dust. In south-central, some winter wheat damaged by winds and blowing dirt.
Heath (Newark area), Ohio	15	Afternoon							Wind and rain	Strong winds during localized thunderstorm unroofed portion of home and carport. Several fallen trees damaged other homes and garages. Heavy rains which followed damaged interior of homes. Damage estimated at several thousand dollars.
Waushara County, Wis.	15	3 p.m.			0	0	10,000	0	Tornado	Tornado struck 2 miles northeast of Neshkoro, moved northeasterly passing over Lohrville and again reaching ground at Redgranite. 2 farmsteads hit, destroying 1 barn and several sheds; trees uprooted; windows broken in 1 farm home. At Redgranite large church moved on its foundation with considerable interior damage. Outhouses and TV antennas by the dozen blown over in Lohrville-Redgranite area. Many roofs and store windows damaged in Redgranite.
Senath, Dunklin County, Mo.	15	3:30 p.m.		1	0	0	°20,000		do	2 farmhouses damaged, 1 completely destroyed. Numerous outbuildings damaged or destroyed. Storm moved northeastward.
Woodbury (near), Cannon County, Tenn.	15	4 p.m.					Slight	Slight	Hail	Some damage to roofs and winter grains. Other crops not far enough advanced to suffer. Hail accumulated to depth of 3 inches in spots.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
San Ygnacio, Zapata County, Tex.	15	4 p.m.	*15	40		8	$10,000	$150,000	Wind and hail	Roofs blown from houses; trees uprooted; electric lines down. Heavy loss to crops, principally cantaloupes and onions. Largest hail size of baseballs. Winds 100 m.p.h. accompanied heavy hail.
Longview, Gregg County, Tex.	15	P.m.							Wind	Blew away 2 lumber sheds, damaged roofs, broke plate-glass windows, and knocked down signs.
Canton, Ohio	15	4:30 p.m.				1	10,000		do	Greatest damage at Canton House Wrecking & Lumber Co. where 40x140-foot storage building unroofed and walls buckled, damaging contents of lumber, roofing, insulation, flooring, and plumbing. In another section of Canton, an oil storage tank which was in process of construction, suffered an estimated $5,000 damage. Safety gate at R.R. crossing blown loose, injuring 1 person.
Webster Groves, St. Louis County, Mo.	15	6 p.m.				1	6,000		Electrical	Lightning caused fire damages to 1 house and inflicted minor burns to 1 occupant.
Ship Island, Miss.	16	3 a.m.					75,000		Wind	Ship damaged during squall.
Whitehouse, St. Bernard Parish, La.	16	3 a.m.				2	5,000		do	Damaged several homes.
New England, Coastal Maine and New Hampshire, eastern half of southern New England except southeastern Massachusetts	16-18	Early a.m., 16th-early a.m., 18th			5				Rain and winds	Rainfall exceeded 3 inches, with a number of stations measuring over 4 inches. Accompanied by strong winds along southeast coast. No serious stream floodings, but many cellars, streets, and roads flooded and rivers and streams ran very high. Scores, of automobiles stalled; hundreds of utility cables put out of commission by water, resulting in disruption of telephone and power services in many localities; 4 persons lost in boating accidents and 1 child drowned in swift-flowing Maine streams. Damage from rain considerable. Wind damage slight.
Wetumpka, Ala.	16	6 a.m.				3	13,000		Thundersquall	Sawmill completely wrecked; several houses unroofed; 1 building destroyed and 1 damaged. Short distance north of Wetumpka large chicken house demolished and several buildings suffered considerable damage to porches and roofs.
Ft. Walton Beach, Fla.	16	7 a.m.			0	0			Wind (possible tornado)	May have been tornado. Duration reported as a few minutes. Plate-glass windows broken, roofs damaged, signs and TV aerials torn down.
Crystal Lake, Fla.	16	7:30 a.m.			0	0	0	0	Tornadoes, rain, and wind	Funnel-shaped clouds moved northeastward, accompanied by roar as if made by fast moving train. Some rain and high, but not destructive, winds. Cloud did not reach ground.
Millville, Bay County, Fla.	16	Morning		2	0	3	10,000	0	Tornado	Storm path not continuous. Duration of storm short and accompanied by noise similar to that of jet plane. 15 homes damaged; 4 buildings destroyed and 3 damaged; 1 house trailer destroyed.
Enterprise (near) and Ozark (near) Ala.	16	8-8:30 a.m.	200 100	½ ½	0 0	0 0	20,000		do	Small tornado first struck about 2 miles east of Enterprise along Ozark highway; 3 houses destroyed and several other buildings damaged. It is believed that this same tornado lifted and struck surface again about 3 miles east of Ozark on Skipperville Road; 1 large and 3 small barns destroyed and 1 dwelling about percent demolished.
Fort Valley, Ga.	16	1:30 p.m.			0	0	1,500	0	do	Damage to homes, garages, TV antennas, trees, and wire lines. Storm path not sharply defined, suggesting possibility that storm barely contacted surface. Wire lines severed between Clinchfield and Warner Robbins, about 15 miles east of Fort Valley.
Eastman, Ga.	16	1:40 p.m.		2	0	0	2,000	0	do	Storm moved eastward through town, but damage spotty and largely confined to roofs.
South Hill, Va.	16	3 p.m.							Wind	Several buildings damaged.
Port St. Joe, Fla.	16	3:30 p.m.			0	0		0	Tornado	Damaged roofs and broke store windows.
Live Oak, Fla.	16								Wind	High wind and wind-blown sand injured corn and tobacco.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

APRIL 1954

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Cape May (near), N. J.	16	P.m.				1			Wind	4 small craft blown ashore. Several persons rescued by coast guard unharmed, 1 man slightly injured.
Dunn, Harnett County, N. C.	16	5:20 p.m.					$750,000		Electrical	Tobacco warehouse, adjoining building, and contents destroyed by fire attributed to lightning.
Lenoxville (near), Pa.	17	2 a.m.			0	0			Tornado and rain	Tornado damaged 4-car garage, destroyed barn, scattered hay bales, and damaged trees and wires. Moved northeastward. Apparently small part of larger storm that took nearly 30 minutes to pass area. Heavy rains briefly flooded low spots on highways.
Reading (near), Pa.	17	2 a.m.			0	0			Tornado	Twister struck at Green Hills golf course. Uprooted and broke trees, picked up refreshment stand and hurled it across road.
Minnesota, northern, central and southern counties	17	A.m. and p.m.				2	5,000		Wind and dust	8 head of cattle electrocuted at St. Paul Workhouse farm when power pole blown down and "live" wires thrown over fence near barnyard. 2 women suffered injuries from high winds in St. Paul. Moderate to thick dust which accompanied storm in northern two-thirds of State reduced visibility to near zero in Alexandria area. Also considerable minor damage to property from wind and numerous grass fires. Considerable soil blowing from plowed fields and soil moisture depleted by high winds.
North Dakota, throughout State	17					3	2,500		Dust and wind	Duststorm rather general although most severe in north-central and eastern sections with visibility at times zero to 1/4 mile. Ice house in Minot collapsed from wind. Building under construction north of Williston damaged by wind, with north and east walls blown down. Poor visibility at least partially responsible for auto accident in which 3 persons hurt. No important crop damage.
Westwood, Denver County, Colo.	19	11:30 a.m.	15	**50	0	0	500	$0	Tornado	Probably a large dust devil.
South Bend, St. Joseph County, Ind.	19-20						5,000		Rain	Bridge approach washed out, basement wall caved in, and other damage.
Phillipsburg (near), Pa.	20	1:30 p.m.				1			Wind	Wind picked up planks and hurled them through auto windows and house window. 1 person slightly injured; house and car damaged.
Unionville, Putnam County, Mo.	20	Afternoon							Electrical	Lightning struck school building, causing considerable damage to brick work and windows and to parked cars nearby. 3 head of livestock also struck and killed by lightning.
Tucson, Ariz.	20	Afternoon and evening					3,000		Wind	4 units of motel unroofed.
Beloit-Lake Geneva area, Rock and Wadworth Counties, Wis.	20	P.m.					2,000		Electrical and rain	Several heavy thunderstorms centered over Beloit and Lake Geneva areas. School at Beloit struck by lightning, which damaged roof, demolished chimney, and caused some interior damage. Struck home, causing minor fire. Lightning hit electric substation at Lake Geneva, doing $700 damage. Rain quite heavy at Lake Geneva. Many storm sewers washed out and numerous basements flooded. Storm moved eastward.
Eustis (6 miles south of), Nebr.	20	8:30-9 p.m.	Narrow	6	0	0	15,000	Little	Tornado and hail	Storm moved eastward. Some hail in vicinity, but this caused little damage. Several sets of farm buildings damaged; 1 set destroyed.
Sheridan, Norton, Phillips, Smith, and Jewell Counties, Kans.	20	8:30-11 p.m.	*20	120			40,200	5,000	Wind and hail	First reported damage west of Hoxie in Sheridan County at 8:30 p.m. from storm developing along squall line. Wind-driven hail destructive in local areas of Sheridan and Norton Counties; severe wind damage from Phillips to Jewell Counties, becoming particularly violent locally. Partial damage figures to property include $8,600 from hail, $31,600 from wind. Crop damage of $5,000 from hail. Maximum hail locally 2 inches in diameter.
Hastings to Juniata, Nebr.	20	9-9:30 p.m.	*1-3	6	0	0	25,000	Little	Wind, hail, and tornado	Possibly small tornado near Juniata connected with this storm.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Pratt, Pratt County, Kans.	20	10 p.m.	*5	10			$20,000	$5,000	Wind	Winds of 75 to 85 m.p.h. associated with squall line destroyed farm buildings from 5 miles south of Pratt to about same distance north, twisted or blew off TV aerials and broke tree limbs in city, and enveloped area in dust cloud.
Fairmont (2 miles north of), Nebr.	20	11 p.m.			0	0	2,000	Little	Wind (probable tornado)	Barn unroofed and other adjacent farm buildings damaged. Storm moved over open fields.
Fort Stockton (8 miles north of), Pecos County, Tex.	21	2:20 p.m.	880	1	0	0	3,500	0	Tornado and hail	Roofs ripped from 2 homes, several damaged. Traveled northward, then circled almost to starting point. Moderate hail.
Libby, Lincoln County, Mont.	21	3:25-3:30 p.m.	67	Short	0	0	Minor	0	Whirlwind	Described as freak windstorm, or whirlwind. A 14- by 8-foot shed overturned, and some damage to picket fence.
Midland, Midland County, Tex.	21	5:10 p.m.			0	0	0	0	Tornado	Pilot informed Weather Bureau at Midland that small tornado existed back of thunderstorm which was in progress at station. It was southwest of Midland and expected to move northeastward. No further information available, probably did not reach ground.
Borden County (northeastern portion), Tex.	21	7:42 p.m.			0	0	0	0	do	Tornado sighted by Texas Highway patrol.
Post (12 miles southwest of), Garza County, Tex.	21	9:15 p.m.			0	0	0	0	do	Tornado sighted by ranch foreman; dipped to ground on ranch land.
Indianapolis, Marion County, Ind.	22	Early a.m.					13,000		Electrical	Modern frame barn destroyed.
Boynton, Pa.	22	2 p.m.			0	0			Tornado	At least 3 persons saw and/or heard passage of small hit-skip tornado. It lifted water 20 feet into air from creek and then scattered it in all directions. Noise reported as like "½ dozen diesel engines". Ripped freshly washed curtains from line and strung them through trees. Storm probably moved eastward.
Huntingdon (near), Pa.	22	6:15 p.m.				2			Electrical	Lightning struck close to 2 men fishing; stunned them, causing slight injuries.
Quinton, Salem County, N. J.	23	P.m.					2,500		do	Lightning struck and ignited residence.
Sayre, Ala.	23	P.m.				1			Electrical and rain	Workman shocked by lightning.
Inman, Spartanburg County, S. C.	24	Afternoon			1				Electrical	
Fremont, Wayne County, N. C.	24	Afternoon			1	1			do	1 child killed and another injured, while playing in yard.
Wilmington, Del.	24				1	2			do	Struck by lightning on golf course.
Bessemer, Ala.	24	P.m.				1	5,000		Electrical and rain	1 person shocked by lightning.
Homewood, Ala.	24	P.m.			1		1,000		Electrical	Boy killed by lightning.
Elkhart and vicinity, Elkhart County, Ind.	24-25	P.m.-a.m.				1	12,000		Electrical and wind	$2,000 wind damage, remainder lightning. Lightning destroyed small house. Wind blew tree over on auto, injuring driver.
Hammond, Lake County, Ind.	24-25	P.m.-a.m.					2,000		Electrical and rain	About $400 lightning damage to home. About $1,600 rain damage; numerous flooded basement.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Illinois, extreme northern portion	24	6-9 p.m.					$20,000		Wind	Damage to farm buildings reported in vicinity of Scales Mound, Blaine, and Freeport.
Beaufort County, N. C.	24	7 p.m.					4,000	$9,000	Hail	
Burdett area, Pawnee County, Kans.	24	7:15 p.m.	*4	7-8					do	Stones up to 2 inches in diameter accumulated 4 to 6 inches deep against buildings 3 miles east of Burdett. Hail of varying intensities over much of southeastern Pawnee County. No damage estimate obtained.
Barton County, Kans.	24	9 p.m.				1			Electrical and winds	Severe thunderstorm, accompanied by winds to 60 or 70 m.p.h. in Great Bend area. Battery of oil storage tanks destroyed by lightning 7 miles southwest of Great Bend. Woman in Ellinwood unconscious 18 hours. Power lines damaged.
Goshen, Elkhart County, Ind.	24	9:45 p.m.					8,000		Wind and hail	2 aircraft practically destroyed by gust of wind. Hail up to 1-1/8 inches in diameter.
Holyrood (north of), Ellsworth County, Kans.	25	12:40 a.m.			0	0		0	Tornado (probable)	Roof ripped from shed, part of which was carried over house to north and dropped onto powerlines.
Sterling, Rice County, Kans.	25	2 a.m.							Electrical	Home badly damaged.
Loma, (6 miles north of), Mesa County, Colo.	25						5,000		do	Fire caused by lightning destroyed CAA Radio Direction Finder.
Brighton, Adams County, Colo.	25		10	**40	0	0	100	0	Tornado	Damage to roof of house.
Tampa Bay, Fla.	25	Afternoon					Small		Wind	Squall with winds in gusts near 50 m.p.h. snapped mast on small sail boat.
Tulia-Conway area, Swisher County, Tex.	25	3:35 p.m.	*10	75		1	40,000	5,000	Hail	Department of Public Safety confirmed hail size of baseballs near Tulia. Hail size of golfballs at Conway. Buildings and autos damaged. Man injured by hailstone which fell through his already-smashed windshield. Storm observed by radar at Amarillo.
Gettysburg-McSherrystown-Hanover, Pa.	25	5:30-6 p.m.	880		0	0			Tornado, electrical, rain and winds	Storm started as active thunderstorm with high winds and rain to south of Gettysburg, where it moved northeastward. Small buildings, trees, and wires damaged; some roads blocked; 3-car collision. Funnel-shaped cloud from west reported by several, apparently originated near McSherrystown and moved eastward into and over part of Hanover. Damage over 1/2 mile wide path included estimated 600 TV aerials ($12,500 repair cost); chimney, tree, and wire damage heavy in narrow path; store windows and unfinished walls damaged; roof from building hurled into brick wall of adjoining house which left gaping hole; barn badly damaged; slate roof and 2 barn doors suffered $1,500 damage; metal awning ripped and damaged to extent of $1,000.
Collyer (near), Trego County, Kans.	25	6:45 p.m.			0	0	10,000	0	Tornado (probable)	Spot damage on 2 farms, (1) 2 miles east of Collyer (2) 6 miles east-southeast of Collyer, indicative of tornadic wind; storm at second location evidently somewhat later in evening than first. Storms moved northeastward.
Marion County, Ky.	25	P.m.					40,000		Electrical and rain	Bolt hit chimney of school, toppling large section of roof into gymnasium. Gym floor damaged by falling roof and heavy rain. Another room in school also damaged.
Minnesota, west-central and east-central counties	25-26	P.m. and a.m.	*10	160			20,000		Electrical, winds, hail, and rains	High winds caused considerable damage, mostly minor, to town and farm buildings. In Benson area, a newly-built barn moved from its foundation, several small buildings wrecked, farm machinery damaged, and straw stacks scattered. Barn badly twisted near Pease. Storm moved eastward. Lightning, hail, and heavy rains that accompanied storm caused much additional damage.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Minnesota, west-central and east-central counties	25-26	P.m. and a.m.					$2,000	$8,000	Hail	Light to heavy hail that accompanied severe thunderstorms caused some damage to real property and to growing crops. Some hailstones size of golf balls, measuring 1½ inches in diameter. In places, ground completely covered by hailstones. Storm moved from west.
Minnesota, west-central and east-central portions	25-26	P.m. and a.m.					35,000	15,000	Rain	Excessively heavy rains that accompanied severe thunderstorms flooded many basements, streets, roads, and highways. Much soil erosion on hillsides. Portions of recently-seeded fields washed out. Some fields under water. Traffic delayed and many automobiles stalled. In low section of Morris, woman evacuated from her home by boat after furnace was washed away. Some rivers and creeks overflowed their banks, and a number of small bridges washed out.
Minnesota, west-central and east-central counties	25-26	P.m. and a.m.					50,000		Electrical	A number of places in scattered localities struck by lightning. 3 barns entirely destroyed by fire and about 24 head of livestock and 1,500 chickens perished. Some reports of severe electrical display, with lightning almost continuous.
Haskell County, Kans.	25	Night					600		do	4 steers killed.
La Grange, Oldham County, Ky.	26						500		do	Lightning killed many sheep and lambs as they huddled in fear of storm.
Illinois, southern portion	26	2:30 p.m.					15,000		Wind	Major damage to Shawnee School in Union County. Minor damage same day in Carlinville and Henderson Grove.
Brown County, Kans.	26	2:30 p.m.						9,000	Hail	Most severe in 6 x 2 mile area in northwestern part of County, but spotted damage elsewhere to wheat and alfalfa.
Camp Decorah, Wis.	26	3:25 p.m.			0	0	600	0	Tornado	Black funnel cloud observed by 2 persons. Funnel dipped to ground striking main part of Boy Scout Camp Decorah between Holmen and Galesville. Demolished 1 small cabin, uprooted many trees. Carried 40-foot tree 60 feet. Telephone and electric lines and poles knocked down. Tornado moved northward.
Custer County, Okla.	26	3:30-8:20 p.m.			0	2	500	20,000	Tornado, wind, hail, and electrical	3 hailstorms struck in scattered areas between Clinton and Weatherford. Hail 1½ inches in diameter. Pilot injured by hail when he parachuted from plane near Weatherford. Woman using phone in Clinton injured by lightning striking telephone line. Tornado caused minor damage at farm 4 miles south of Clinton. Property damage listed caused by wind, crop damage by hail, minor damage by tornado.
Caddo and Washita Counties, Okla.	26	3:30-8:30 p.m.			0	0	500	15,000	Hail and tornado	Hail up to 1½ inches in diameter in Caddo County near Fort Cobb; and in Washita County west of Cordell. Tornado and hail in Dill City area. Tornado funnel, not touching ground, observed by several persons southwest of Dill City. All damage by hail.
Wichita (north of), Sedgwick County, Kans.	26	3:40 p.m.	*7				1,000		Hail	Storm moving from west damaged roof and glass at Ripley plant (north of Wichita) of Kansas Gas and Electric Company.
Jewell County, Kans.	26	4 p.m.					Light	1,000	do	Spot damage to growing crops and occasional damage to roofs and windows from hailstones, ranging up to nearly 3 inches in diameter.
Andover, Wis.	26	4 p.m.			0	0			Thunderstorm (possible tornado)	2 farms hit north of Andover. Brooder house moved across road. Parts of barn torn off and deposited in field. Roof of scale house carried over main barn and deposited in adjacent field. End of main barn pushed in.
Wayne County (eastern portion), Iowa	26	4 p.m.		6					Hail	Heavy hail from Promise City to Seymour. Minor damage northwest of Seymour where windows on north and west sides of house broken. At Albia ground white with hail.
Winter Haven, Fla.	26	4 p.m.					Small	Minor	do	Stones "walnut to egg" size broke a few windows and and caused minor damage to citrus fruit.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Miller (1-3/4 miles north of), Lyon County, Kans.	26	4:20 p.m.	20	1	0	0	$600	$0	Tornado and hail	Roof lifted from house, 6 trees uprooted, and barn moved at 1 farmstead. No funnel observed. Hail as large as golf balls in scattered areas.
Clay County (northern part), Kans.	26	5 p.m.	*1	20				10,000	Hail	In scattered sections hailstones up to size of walnuts damaged wheat.
Clay County, Iowa	26	5:25 p.m.	Narrow	9	0	0	500	0	Tornadoes	Four funnel clouds observed traveling south-southeastward from vicinity of Royal to vicinity of Cornell. Funnel clouds also seen from other southern Clay County communities. Damage to farm buildings in the vicinity of Rossie.
Gotebo and area northwest of Mountain View, Kiowa County, Okla.	26	5:30-8 p.m.	*10	20	0	0	2,500	7,500	Hail, wind, and tornado	1200 to 1500 acres of wheat damaged to 50-100 percent. Funnel sighted, did not hit ground. Property damage by wind; crop damage by hail.
Keokuk County (southeastern portion), Iowa	26	5:45 p.m.					5,000		Wind	Major damage on farm near Richland; also reported southwest of Keota and at Abingdon.
Carnegie (near), Caddo County, Okla.	26	6-6:05 p.m.	50	1	0	0	0	0	Tornado	A small tornado, moving east-northeastward, dipped into open field.
Grady County, Okla.	26	7-10 p.m.					18,000	12,000	Wind and hail	Hail ½ to 1 inch in diameter spotted over large area in central Grady County where wheat damaged 75 percent. About $6,000 property damage due to wind, remainder of losses due to hail.
Scott County (northwestern portion), Iowa	26	7:30 p.m.	Narrow	Short	0	0	1,000	0	Tornado	"Roaring" sound heard but funnel cloud not observed. Storm moved south-southeastward across farm 3½ miles north of New Liberty, damaging buildings and killing 1 cow.
Carbondale (west of), Osage County, Kans.	26	Evening							Electrical	Home and contents burned.
New Hope and Colfax, Clinton County, Ind.	26						5,300		Wind	Church chimney blown off and roof heavily damaged. Barn blown down. Some damage to roof and plastering of 1 dwelling.
Antioch, Garvin County, Okla.	27	2 a.m.	Narrow	Short	0	0	6,000	5,000	Tornado and hail	Tornado funnel observed touching ground twice, damage to 3 houses. Several fields of oats, and a number of gardens damaged by hail.
Freeport, Pa.	27	Afternoon							Electrical	Lightning fired and partially destroyed barn, did minor damage to church, 3 power transformers, and water tank, and downed power lines.
Jamestown-Corry-Oil City-Warren area, Pa.	27					1			Electrical, rain, and wind	Series of storms swept over area. At Corry, winds damaged outbuildings, trees, wires, and TV aerials. Lightning injured man talking on telephone. At Oil City, 2 garages blown over and lightning damaged chimney. Near Walnut Bend, lightning struck and fired barn with loss of barn, 11 head of cattle, stored grain, and farm equipment. East of Warren, rains washed out 500 feet of railroad roadbed, slowed trains. At Jamestown, 1 inch of rain which fell in 15 minutes, caused temporary flooding. Minor damage from lightning strikes also occurred.
Florence (near), Pa.	27								Electrical	Lightning struck and fired barn, causing large loss.
Windber, Pa.	27	Afternoon							do	Lightning struck brick building, knocked bricks from about 6x30-foot section at top of building onto new car parked at side of building.
Clearfield, Pa.	27	Afternoon							Tornado (incipient)	Tornado-like wind cut swath across Westover Borough. It uprooted trees, shattered windows, and downed wires. Buildings rocked; groceries knocked from shelves.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Brookville, Pa.	27	2 p.m.							Electrical and rain	Lightning fired and destroyed barn and contents of 2 head of cattle, grain, and farm equipment. Heavy rains flooded low spots on highways.
Russellville, Pope County, Ark.	27	Afternoon				2			Electrical	Lightning struck house, injuring 2 women.
Rochester, Haskell County, Tex.	27	4 p.m.	*1½	6			$3,000		Wind and hail	Moved northeastward. Some buildings unroofed; small buildings blown over. 90 percent wind and 10 percent hail damage.
Madisonville, Hopkins County, Ky.	27	4:45-6 p.m.					1,250	$750	Electrical and hail	Lightning struck and destroyed barn. 200 bales of hay and 200 bushels of corn lost in resulting fire. Some hail reported to have fallen, but it entailed little damage.
Central City, Muhlenberg County, Ky.	27	5:30 p.m.				2	1,000		Electrical	Lightning struck and did considerable damage to home.
Marshall County, Ky.	27	5:30 p.m.					5,000		Wind, hail, and rain	Storm uprooted trees, damaged some cabins, and extensively damaged 2 planes. Greatest damage by wind. Hail piled up 2 to 3 inches deep in some areas.
Cleveland County (eastern portion), Okla.	27	6:15-6:45 p.m.	*1	2½			8,000	1,250	Hail	Hail, average size 1 inch, maximum 3 inches, caused considerable roof and garden damage.
Lake Creek Community, Greer County, Okla.	27	6:30 p.m.	Narrow	Short	0	0	1,000	Minor	Tornado	Tornado damaged brooder house and poultry.
Ballinger, Runnels County, Tex.	27	6:30 p.m.			0	0			do	Moved southwestward. Funnel-shaped cloud took roof from home, demolished chicken house, and blew windows in. Garages unroofed and moved from foundations.
Adena, Ohio	27	6:55 p.m.	50	1	0	1	75,000	0	do	Whirling black column tornado wrecked garage building, badly damaged 3 other buildings, and caused minor damage to a dozen other houses along Main Street. Man injured was in apartment over the garage. Other damage to parked cars, plate-glass windows, trees, chimneys, and fuel tanks.
Woodford, Jessamine, Bourbon, Fayette, and Bath Counties, Ky.	27	7:30-8:30 p.m.					29,400	4,000	Electrical	Lightning struck 3 barns and 3 buildings and disrupted telephone service. Several farm animals killed and large quantity of hay lost. Also other property damaged or destroyed.
Ardmore, Okla.	27	Night					Considerable		Hail and electrical	Hail in southern part of city caused heavy damages to many roofs. 3 places set on fire by lightning, with minor damage.
Atoka (near), Atoka County, Okla.	27	Night					5,000		do	Some hail damage to crops. 1 barn and 3 horses burned by fire, resulting from lightning.
Earle, Crittenden County, Ark.	27	Night					2,000		Wind and electrical	1 barn and several smaller buildings damaged.
Vidalia (4 miles west of), La.	28	6 a.m.	50	½	0	0	5,000	0	Tornado	Damaged several homes; funnel observed.
Bottineau, Rolette, Towner, Cavalier, and Pembina Counties and parts of Pierce, McHeory, Ward, and McLeod Counties, N. Dak.	28						100,000		Ice (glaze)	Freezing rain struck heaviest along Canadian Border from Bottineau County to Pembina County, doing considerable damage to commuoication and power lines. Some communities isolated up to 2 or 3 days from long distance telephone service. REA lines generally not interrupted for more than a few hours in most areas. A few small towns without power up to a day or 2 in Towner and Cavalier Counties. Trees damaged; a large number of television antennas damaged by heavy accumulation of ice. In some protected areas ice was still on trees and screens of north sides of houses nearly a week after storm.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4--Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
National Reactor Testing Station, Butte County, Idaho	28	12:20 p.m.	880		0	0	$0	$0	Tornado and hail	Long, slender funnel-shaped appendage developed at base of thunderstorm cloud. Funnel, visible for 5 minutes, showed some rotating motion as it extended halfway from cloud base to ground and then retracted into cloud base. Hail fell to depth of 1 inch over path about ½ mile wide. No unusual wind disturbance observed at ground.
Forsyth, Pender and Scotland Counties, N. C.	28	4 p.m.						6,000	Hail	8 square miles damaged in scattered areas.
Clifton (6 miles east of), Bosque County, Tex.	28	5 p.m.	100	2	0	0			Tornado	2 twisters formed 6½ miles east of Clifton, 1½ miles north of Coyote. Stayed in air most of time, but 1 dipped and cut an electric line, unroofed barn, destroyed a few small buildings, and moved house from its foundation. Braniff airline pilot saw 2 funnel clouds northwest of Waco.
Shannon Community (9 miles northeast of Mc Calla), Ala.	28	P.m.					2,000		Electrical	Dwelling struck by lightning and burned.
Mountain Section, Greenville County, S. C.	28	6-11 p.m.			4				do	
Spartanburg, S. C.	28	6:30 p.m.					1,000		do	Residence damage by lightning.
Fulton (7 miles northeast of), Itawamba County, Miss.	28	7 p.m.			0	2	8,000	Slight	Tornado	
Kendrick, Alcorn County, Miss.	28	7 p.m.			0	0	3,000	0	do	2 funnels observed; apparently 1 moved into Tennessee striking at Walkertown.
Walkertown, Hardin County, Tenn.	28	7:15-7:30 p.m.	300	2	0	4	55,000	0	do	New store destroyed, several automobiles damaged, and 20 to 25 roofs torn off or damaged. Power and telephone lines blown down. Storm moved northeastward.
Broken Arrow (west of), Tulsa County, Okla.	29	1:13 a.m.			0	0	0	0	do	Funnel cloud observed. Moved northeastward.
Hatchel and Norton Runnels County, Tex.	29	2:50 p.m.			0	1			do	Sheep pens destroyed. Barn blown into house, causing considerable damage. Woman injured when thrown by wind.
Roger Mills, Ellis, and Dewey Counties, Okla.	29	Afternoon	Narrow	33	0	0	25,000	5,000	Tornado and hail	Tornado first observed in northern Roger Mills County; as it moved northeastward into Ellis County funnel dipped to ground 3 times, tearing up blacktop paving on highway and damaging 3 farmsteads. As tornado moved into northern Dewey County, near Vici, considerable damage occurred on 5 farms. Hail struck to north of tornado path in Ellis County with considerable damage to crops in area 11 miles long.
Orangeburg, S. C.	29	3 p.m.					°3,000		Wind	Storm hit hardest 1 mile southwest of Orangeburg where trees uprooted, farm buildings blown away, and houses left tilted off foundations. Winds estimated up to 60 m.p.h.
Amorita and Orion, Alfalfa County, Okla.	29	3:30 p.m.	100	3/4	0	0	1,000	0	Tornado	Funnel cloud observed touching ground. 1 farmstead struck near Orion Community.
Barber, western Harper, and Kingman Counties, Kans.	29	4:30-6:30 p.m.			0	0		11,200	Hail and tornadoes	Several funnels reported from Kiowa, Corwin, and Attica, touching ground 6 miles northeast of Attica at 5:05 p.m. 3 separate hail showers at Attica, 2 in Kingman County. Large irregularly shaped hailstones. Damage to crops from hail in Kingman County.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Alva (15 miles west of), Woods County, Okla.	29	5 p.m.					$5,000	$0	Wind	Machine shed destroyed.
Roger Mills, Custer, Blaine, Canadian, and Dewey Counties, Okla.	29	5 p.m.-midnight					Extensive	Extensive	Rain and hail	Accompanied by marble-size hail, but no damage by hail. Extensive damage by floods as result of heavy rains, especially in Roger Mills County where unofficial amounts up to 10½ inches at Red Moon (near Cheyenne) fell in few hours time.
Dewey County, Okla.	29	5:30-6:30 p.m.	*6	15	0	0	26,000	32,000	Tornadoes, electrical, wind, and hail	Estimated damage by wind to buildings $25,000 and estimated damage by hail to wheat and oats crops $32,000, (included in totals). Hail 3/4 to 2 inches in diameter, covered 50 percent of ground. Lightning struck house near Camargo, causing about $100 damage. 4 tornado funnels observed in path 4 miles long from west of Camargo northeastward toward Cestos with damage estimated at $900 to a number of buildings.
Loyal (southeast of), Kingfisher County, Okla.	29	6:45 p.m.	100	4	0	2	36,400	1,600	Tornado, wind, rain, and hail	Path northward. 4 farmsteads damaged. Storm moved slowly taking about 15 minutes to cover path 4 miles long. Accompanied by rain and hail. About $31,000 of loss by tornado; about $7,000 by wind. Average size of hail ½ inch, a few up to 5 inches in diameter.
Perth (4 miles west of), Sumner County	29	7 p.m.	*½-1	2			7,500		Wind	Buildings on several farms damaged. Storm moved eastward.
Valley Center (near), Sedgwick County, Kans.	29	7:10-7:27 p.m.			0	0	0	0	Tornado	Funnel reported 3/4 mile east of Valley Center at 7:10 p.m. and 7 miles northeast touching ground at 7:27 p.m.
McPherson, McPherson County, Kans.	29	7:30 p.m.					Several thousand		Electrical	Heavy damage from fire to church, and minor damage to home and store.
St. Paul, Minn.	29	9:40 p.m.					1,500		do	Home set afire by lightning.
Comanche and Stephens Counties, Okla.	29	9:45 p.m.	*10	20	0	0	20,000	0	Tornado and wind	Extensive damage to buildings, trees, and windows by high winds in Lawton, Marlow, and Comanche, as well as in rural areas. Winds in Lawton estimated up to 74 m.p.h. Minor damage by tornado.
Hughes and Creek Counties, Okla.	29	Evening					50,000	28,000	Rain	Heavy rain caused widespread damage by local floods to roads, fences, and crops.
Kaw City, Kay County, Okla.	29	10:20 p.m.					100,000		Electrical	Lightning set fire to grain and feed supply house.
Caddo County, Okla.	29	10-10:45 p.m.							Wind and hail	Widely scattered damage throughout County. Winds estimated at 75 to 80 m.p.h. in Apache and Anadarko areas.
Liberty, Montgomery County, Kans.	29	11 p.m.	50	3/4	0	0	1,000	0	Tornado (probable)	Damage to half dozen farms just southwest of Liberty indicative of tornado. No funnel seen, but loud roar heard. Storm moved northeastward.
Yukon (3 miles west and 1 mile south of), Canadian County, Okla.	29	Night	Narrow	2	0	0	Considerable		Tornado	Damage to 4 farmsteads in path to northeast.
Perry (2 miles west of), Okla.	29	Night							Electrical	Barn struck by lightning and burned to ground.
Uniontown, Bourbon County, Kans.	29	Midnight							Wind	Locally severe wind blew down trees and limbs, broke window panes, and tore off TV antennas.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Fairy, Hamilton County, Tex.	30	12:30 a.m.	880	6	0	0	$15,000	$1,160	Tornado	Tornado dipped several times. 8 homes and 14 other buildings damaged. Several windmills and TV antennas blown down and completely destroyed. Some chickens and sheep killed.
Konawa, (4 miles west of), Pontotoc County, Okla.	30	1 a.m.	Narrow	Short	0	0	1,000	0	do	Damage to buildings on 3 farms. Path northward.
Ft. Worth-Smithfield area, Tarrant County, Tex.	30	5:18 a.m.				2	750,000		Wind	Roofs damaged; plate-glass windows broken; small buildings destroyed. Pepsi Cola plant had $30,000 to 40,000 damage. Radio tower bent over with top section touching ground. Traveled northeastward through most of Ft. Worth and to Smithfield.
San Antonio, Bexar County, Tex.	30	5:30 a.m.					25,000		do	Radio tower broken off by wind vibration account of tight guy wires. Lumber yard shed destroyed and trailer turned over. Parked aircraft at Randolph Field damaged, but estimate of damage unobtainable. Storm moved east-southeastward, with no discernible path.
Williamson, Milam, Robertson, Leon, and Houston Counties, Tex.	30	6:10 a.m.	880	140	0	6	200,000		Tornado	Storm originated 5 miles southwest of Couplant and traveled through Beyersville northeastward through Gause to Grapeland. Heavy damage to barns and homes. 3 gins and 3 homes completely demolished. 2 cars crushed. Other buildings damaged.
Lee, Fayette, and Washington Counties, Tex.	30	6:30 a.m.	*1	20	0	2	11,000	1,000	do	Damaged and destroyed houses and barns; killed poultry and livestock. Traveled northeastward from Serbin-Northrup area, Lee County, through Carmine, Fayette County, and La Bahia community, Washington County.
Dallas, Dallas County, Tex.	30	6:30 a.m.	150	16		1	400,000		Wind	First struck Oak Cliff section, then across South Dallas to Fair Park area where approximately one-half of damage occurred, then northeastward into the country. State Fair auditorium heavily damaged when wall section collapsed.
Bremond-Eloise area, Robertson and Falls Counties, Tex.	30	7 a.m.	*1				Several thousand		do	2 farm houses leveled; roofs torn off other buildings; trees uprooted.
Bryan (2½ miles south of), Brazos County, Tex.	30	7:30 a.m.			0	0			Tornado	Demolished 2 churches and 2 homes. Cloud confirmed by CAA at College Station.
Trinity, Angelina, and San Augustine Counties, Tex.	30	8 a.m.	880	70	0	23	65,000	25,000	do	Planing mill blown down; chicken house destroyed; homes damaged by falling trees. Timber badly damaged. Moved from Groveton, Trinity County northeastward through Angelina County to San Augustine, San Augustine County.
Tyler, Smith County, Tex.	30	8:56 a.m.				2	200,000		Wind	1 hangar blown down; 2 others damaged. Beechcraft plane destroyed. Many buildings damaged.
Mineola, Wood County, Tex.	30	9 a.m.							do	2 filling stations blown down. Pickle factory destroyed.
College Station, Brazos County, Tex.	30	9:05 a.m.			0	0	0	0	Tornado	Funnel not reaching ground reported by A&M College. Probably same storm reported at Tabor (Brazos County) where considerable damage reported on Schmidt plantation and barn damaged $6,000 on another farm.
Northfield, (vicinity of), Minn.	30	A.m.					5,000		Electrical	Barn set afire by lightning and burned to ground. 1 milk cow perished in fire.
Hugo, Okla.	30	9:30-9:45 a.m.	150	1	0	12	150,000	0	Tornado	Path northeastward through city, with extensive damage in at least 20 square blocks. Funnel observed.
Lone Star (9 miles south of Daingerfield), Morris County, and Atlanta-Bloomberg area, Cass County, Tex.	30	10:30 a.m.	40	36	0	1	12,000	0	do	5 buildings severely damaged or destroyed at Lone Star. At Atlanta, house blown from foundation; barn unroofed. Also damaged house and 2 barns in Bloomberg, 8 miles east. Moved into southwestern Arkansas.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Stigler (near), Haskell County, Okla.	30	10:45 a.m.	Narrow	Short	0	0	$2,000	$0	Tornado	School house damaged by tornado that approached from southwest. Teacher and children sought safety in automobile and drove away.
College Hill Community (7 miles south of DeKalb), Bowie County, Tex.	30	11 a.m.	440	2	0	0	7,000		do	1 home demolished; another damaged. Store unroofed and other buildings damaged; trees uprooted. Moved northeastward into southwestern Arkansas.
Miller, LaFayette, and Nevada Counties, Ark.	30	11 a.m.-noon	50	45	0	0	10,500	0	do	Tornado originating in Atlanta, Texas, entered southwestern Arkansas in Miller County. It moved northeastward causing $4,500 damage at Fouke about 11:15 a.m., and $6,000 damage to property at Bodcaw about noon.
Little River, Howard, Pike, Clark, Hot Springs, and Garland Counties, Ark.	30	11 a.m.-12:54 p.m.	*1	95	0	2	250,000	0	Tornado and wind	Tornado, originating in College Hill and DeKolb areas of Texas, entered southwestern Arkansas in Little River County. As it moved northeastward damage reported in or near following places: Schall, Mineral Springs, Nashville, Bingen, west of Amity, Bismarck, and Hot Springs. At Nashville where tornado struck between 11:30 a.m. and 12:15 p.m., 2 persons injured and property damage of $150,000 (included in total). At Bismarck, about 12:45 p.m., $4,000 damage. At Hot Springs where tornado damage estimated at $25,000 and wind damage $50,000, tornado struck at 12:50 p.m.
Fort Smith (southern suburbs and southern section of), Ark.	30	11:10 a.m.	Narrow	Short	0	0	2,000	0	Tornado	Persons at Cavanaugh (south of Ft. Smith) saw funnel cloud dip to earth 3 times. Also observed in southern part of Ft. Smith. Damage to buildings and trees.
Crawford and Washington Counties, Ark.	30	11:55 a.m.-12:25 p.m.	*1½	4	0	1	110,000	0	do	Path from Natural Dam, Crawford County, northeastward into Washington County through Greenland, Harris, and Goshen Communities. Numerous poultry houses damaged in and around Goshen.
Johnson County, Ark.	30	12:30 p.m.	100	12	0	0	16,000	0	do	Path northeastward from Hartman to west of Clarksville. Extensive damage to several farmsteads. 6,000 baby chicks and broiler house damaged at Hartman.
Prairie County, Ark.	30	12:30 p.m.			0	0	Minor	0	do	1 shed damaged. Funnel seen in Letchworth Community, south of Des Arc.
Between Cassville and Roaring River in Barry County, Mo.	30	1 p.m.		6	0	0		0	Tornado (possible)	Storm tore trees apart, damaged outbuildings and small equipment.
Fordyce (near), Dallas County, Ark.	30	1:30 p.m.					750		Wind	Damage to house, barn, farm machinery, and trees on 1 farmstead.
Many, (8 miles south of), Sabine Parish, La.	30	1:30 p.m.	100	15	1	6	25,000	Slight	Tornado	Moved from community of Negreet to southeast of Many; mostly farming or timbered area. Homes and outbuildings damaged.
Jonesboro (6 miles west of), La.	30	2 p.m.				1	2,000	Slight	Wind	Squalls also reported in Natchitoches, Jena, Colfax, and other sections of north-central and northeast Louisiana but damages slight.
Pollock, La.	30	2 p.m.				1	1,000	Slight	do	
Varsailles, Morgan County, Mo.	30	2-3 p.m.	400	3	0	1	45,000	5,000	Tornado	1 house levelled. Several outbuildings destroyed. Woman injured by flying debris.
Searcy area, White County, Ark.	30	2:30-3:30 p.m.					2,000		Wind	Scattered wind damage to roofs and buildings.
Yuma area, Ariz.	30	Afternoon and night						5,000	do	Strong winds caused considerable sandblasting of tender crops and tangled melon vines, as well as dislodging blooms and small melons.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Perry County, Mo.	30	Afternoon							Hail and wind	Damages to roofs, windows, crops, and small trees.
Poplar Bluff, Butler County, Mo.	30	Afternoon					°$5,000		do	Damage to windows, roofs, and small outbuildings. Crops and small trees damaged by hail and wind.
West Plains, Dunklin County, Mo.	30	Afternoon					15,000		Wind	Power and telephone equipment and service inoperative for several hours. Minor damage to sidings, roofs, and windows.
Jefferson City, Cole County, Mo.	30	3-4 p.m.				2			do	Large and small trees blown down and damaged. Large tree toppled across car and injured occupants. Power and telephone services out. Windows, roofs, and sidings damaged.
Bartow, Fla.	30	3 p.m.			0	0	1,000	$0	Tornado and hail	Tornado moved westward. Roof of home and 1 other building damaged.
Woodruff County, Ark.	30	3-3:30 p.m.					1,500	2,000	Wind and hail	Scattered damage throughout County.
Lawrence and Green Counties, Ark.	30	3:15-4 p.m.	100	35	0	0	41,200	0	Tornado	Damage in Arbor Grove area in eastern Lawrence County estimated at $40,000; in Hoxie area $200; in Beach Grove area $1,000.
Sturgeon, Boone County to Kahoka (9 miles south of), Clark County, Mo.	30	3:15 p.m.			0	0			Tornado (possible)	1 barn and possibly several outbuildings demolished. Continued into Iowa.
West Monroe, La.	30	3:30 p.m.			0	1	100,000	Slight	Tornado	Destroyed most of waterworks, and nearby buildings badly damaged. Moved northeastward.
Linn, Osage County, Mo.	30	4 p.m.				1	4,000		Wind	Storm affected small area. Unroofed department store building. Windows and siding damaged.
St Louis City and County, Mo.	30	5-6 p.m.				3			Wind and electrical	2 persons injured by falling tree pinning them to inside of auto. Damages extensive and involved signs, plate-glass windows, sidings, and roofs. Power and telephone services disrupted for several hours. Considerable damage to TV antennas.
Iowa, eastern portion	30	5:15-8:30 p.m.	*1/4		1	9	1,240,000	0	Tornadoes	Family of 5 tornadoes (1) Intermittent along path 180 miles long moving from vicinity of Sturgeon, Mo., at 3:15 p.m. to 3 miles southwest of Lowden, Cedar County, 7 p.m. 1 death from injuries received from this tornado. Forward movement about 60 m.p.h. (2) Touched ground occasionally for distance of 70 miles from extreme SE Iowa to 1 mile east of Delaware, Delaware County. Most severe damage to farming community 6 miles southeast of Ryan, Delaware County. (3) Intermittent over distance of 85 miles from small community of Linn Grove northwest of Cedar Rapids at 7 p.m. to town of Garber, in southern Clayton County, thence to Wine's Landing near Harper's Ferry at 8:30 p.m. (4) Last tornado of family traveled a short distance 3½ miles north of Lamont, in Buchanan County at 7:30 p.m., demolishing a farmstead there. Since paths of these tornadoes mostly over rural areas, touching only small towns of Franklin and Mt. Union in southeastern Iowa, LaFayette in east-central Iowa, and Garber and Wine's Landing in northeastern Iowa, damage figures are necessarily incomplete. Reports indicate major damage to 114 farmsteads, homes, or town buildings. Damage on farmsteads would include several buildings. Loss of livestock heavy, including 100 hogs on sausage farm near Letts. No reports of funnel clouds observed. (5) Intermittent for distance of 20 miles from 1 mile south of Monticello to 3 miles southeast of Dyersville; greatest damage vicinity of Worthington and Dyersville in Dubuque County; from about 7:05 to 7:30 p.m., total of 8 farmsteads severely damaged.
Illinois, southwestern portion	30	5:45-6:30 p.m.			1				Wind	Series of windsqualls with damage mostly light, in vicinity of Belleville, Carlinville, Carthage, Gillespie, Kinmundy, Jacksonville, Litchfield, and St. Elmo. Farmer killed in storm accident near Hillview.
Scott County, Iowa	30	Evening		18			20,000		do	Damaging windsqualls struck 6 farms from vicinity of Blue Grass to vicinity of Long Grove.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Grant County, Wis.	30	8:15 p.m.					$100,000		Wind	Severe wind squalls appeared first at Burton and continued northward; heaviest damage on line from Burton through Hurricane, Lancaster, Mt. Ida, and Woodman. 2 farms damaged, 3 barns destroyed, 2 others damaged, 10 other farm buildings destroyed, several more damaged. Electric and telephone lines blown down also many TV antennas. Some windows broken and trees uprooted. Several head of cattle killed in barns destroyed. Many chickens also killed.
Pulaski, Scott County, Miss.	30	Late evening		6	0	0	0	$0	Tornado	Moved through uninhabited timbered area.
Colby, Thomas County, Kans.	30	Night					Several thousand		Electrical	Lightning struck transformer at Central Kansas Power Company.

* Miles instead of yards.
** Yards instead of miles.
° Crop damage included with other property damage.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

APRIL 1954

There was no significant flooding during April. All floods reported were light or minor. New low monthly mean stages were established on the Arkansas and Cimarron Rivers.

ST. LAWRENCE DRAINAGE.--Lake Ontario.--The flooding on the Oatka Creek at Garbutt, N.Y., and Black Creek at Churchville, N.Y., between the 6th and 8th was due almost entirely to snowmelt. There were 9 inches of snow on the ground at Warsaw, N.Y., in the upper reaches of Oatka Creek on the morning of the 4th. This snow was completely gone by the morning of the 7th. Considerable acreage in the lower reaches of both streams was under water, but little damage resulted as the land was not yet under cultivation.

ATLANTIC SLOPE DRAINAGE.--Some minor flooding occurred in riverside cellars along the Kennebec River at Augusta, Maine, on the 19th and 24th. The high water on the 19th was due to heavy rain (2.5 to 3 inches) between the 16th and 18th. The high water on the 24th was caused by high temperatures and snowmelt. By the end of the month river levels were again normal and practically all snow cover was gone.

The flooding in New Hampshire on the 18th and 19th was due to heavy rainfall (2.5 inches) and runoff from snow remaining in the higher elevations of northern New Hampshire. Flows varied from just below to just above flood stage in all sections of the Merrimack Basin. No damage resulted from the minor overflows.

The heavy rain on March 29 to April 1 caused some light flooding on the Neuse and Cape Fear Rivers in North Carolina. The rainfall averaged 1.3 inches over the Neuse Basin and 1.5 inches over the Cape Fear Basin. No damage was reported.

Locally heavy showers on the evening and night of March 31 caused the Broad River at Blairs, S. C., to rise a few feet above bankfull stage on April 1.

Heavy rains on the 1st caused light flooding on the Pee Dee River at Peedee, S. C., between the 3d and 7th. No damage was reported.

EAST GULF OF MEXICO DRAINAGE.--The flooding on the Tombigbee River at Lock #3, Whitfield, Ala., between the 18th and 22d was due to light to heavy rains on the 16th and 17th. No damage resulted as the section inundated is unusually low and subject to frequent flooding.

Minor flooding occurred in the Pearl River from Jackson, Miss., to Pearl River, La., early in the month due to runoff from heavy rain (over 3 inches) on March 26 and 27. Damages were slight and were due to brief work stoppage in the flooded areas.

UPPER MISSISSIPPI BASIN.--The flooding in the Chippewa River at Durand, Wisc., on the 29th and 30th was due to rainfall alone and not to a combination of melting snow and rain as is generally the case in mid-April. Snow had practically disappeared by the time the heavy rainfall set in on the 15th. Floods did not develop in the Kickapoo or Root Rivers as is usually the case at this time of the year, and only moderate flooding occurred in the Upper Iowa and Zumbro Rivers near the end of the month. The rainfall on the 15th averaged 4 inches in the central Chippewa Valley and approximately 2.25 inches over the Chippewa Drainage. The rain on the 26th and 27th covered a larger area than on the 15th and averaged slightly over 4 inches during the 36- to 48-hour period. This period of excessive rainfall was sufficient to bring the Chippewa to flood stage at Durand, Wisc., on the 29th. Most of the damage was confined to soil erosion and highway damage. Agricultural damage was slight because most crops had not been planted at this time due to the cool weather. The flood at Durand on the 29th was high enough to enter some of the basements of the warehouses along the river shore.

The rise in the upper reach of the Mississippi River began on April 8, due to runoff from snowmelt caused by abnormal temperatures between the 5th and 16th which melted the snow layer. The Mississippi River which began overflowing at Aitken, Minn., on the 13th, crested on the 21st at a stage of 13.23 feet, and continued in flood through the end of the month. Flooding developed at Libby, Minn., on the 29th and continued into May from the rain on the 25th and 26th.

MISSOURI BASIN.--The Milk River and tributaries above Nashua to near Chinook, Mont., flooded lowlands between the 6th and 9th due to rapid snowmelt. Eleven families were forced to evacuate their homes in Nashua, Mont., when Porcupine Creek overflowed, and 3 families near Harlem when 30-Mile Creek flooded. Below Nashua in Roosevelt County the overflow of the Poplar River forced 50 families to leave their dwellings. Most of these people lived on the Fort Peck Indian Reservation between Wolf Point and Culbertson, Mont. The river, normally a small stream, was 1 mile wide and 25 feet deep in some areas. No lives were lost. Considerable damage resulted to roads, bridges, and homes.

The Heart River in southwestern North Dakota overflowed and flooded 32 homes in the residential section of Belfield on the 5th. This overflow was due to the rapid melting of a 13-inch snow cover and 0.5 inch of rain. One person was injured as a result of the flood.

OHIO BASIN.--The flooding on the Green River at Woodbury, Ky., Lock 4, was due to heavy rain (2 inches) during the period from the 15th to the 17th. The flooding lasted about 48 hours and as far as could be determined no damage occurred.

The heavy rains (1.25 inches) from the 5th to the 7th caused the White River to exceed flood stage at Edwardsport, Ind., on the 9th and 10th. No damage resulted as the bottom lands are protected by levees at that point.

ARKANSAS BASIN.--The only flooding reported in the Arkansas Basin during April was on the Verdigris River at Coyville, Kans., on the 27th. It was very minor and was due to rainfall that was considerably higher than the 1-inch basin average. An unofficial 4-inch rainfall amount was reported farther upstream.

The mean monthly stage of the Arkansas River at Tulsa, Okla., was 3.0 feet, or 2.9 feet below normal, establishing a record-low mean monthly stage for April.

At Van Buren, Ark., the mean monthly stage was 3.6 feet, 8 feet below normal, and 1.0 foot below the previous low mean monthly stage of April 1936. The Cimarron River also established a new record-low mean monthly stage at Perkins, Okla.

RED BASIN.--The flooding on the Washita River between Cheyenne, Okla., and Clinton, Okla., during the evening of the 29th and 30th was due to rainfall of cloudburst proportions. Ten and one-half inches of precipitation was reported at Red Moon and Strong City, Okla. Likewise, Reydon reported 8.5 inches and Bittner 7.5 inches.

WEST GULF OF MEXICO DRAINAGE.--Minor flooding occurred on the Sabine River at Mineola, Tex., on the 19th and 20th due to locally heavy showers of 2 to 5 inches between the 9th and 16th.

Minor flooding occurred on the East Fork of the Trinity River at Rockwall, Tex., during the forenoon of the 12th. No damage was reported.

Heavy rains in the vicinity of Alamo, Tex., during the period of the 8th to the 15th produced serious local flooding in a 30-square mile area around Alamo, Tex. Rainfall during this 7-day period totaled 14 to 18 inches. Most of the flooding was due to inadequate drainage for such heavy rain, and there was actually no flooding from the nearby Rio Grande. Several thousand persons were evacuated because of the health menace caused by overflowing septic and sewage lines. This high water receded very slowly and caused considerable inconvenience to local residents.

PACIFIC SLOPE DRAINAGE.--The heavy rain between the 3d and 9th brought rises to the Sacramento River that caused the operation of three of the flood control weirs. No loss or damage was reported from operation of the weirs.

FLOOD STAGE DATA

Table 5

(All dates in April unless otherwise specified)

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
	Ft.			Ft.	
ST. LAWRENCE DRAINAGE Lake Ontario					
Oatka Creek: Garbutt, N. Y.	5	6	8	5.6	7
Black Creek: Churchville, N. Y.	5	7	8	5.4	7
ATLANTIC SLOPE DRAINAGE					
Baker: West Rumney, N. H.	7	18	18	7.5	18
Pemigewasset: Plymouth, N.H.	11	18	18	11.5	18
Merrimack: Manchester, N. H.	7	19	19	7.2	19
Neuse: Smithfield, N. C.	13	1	4	°14.7	3
Goldsboro, N. C.	14	3	7	°15.2	6
Cape Fear: Lock No. 2, Elizabethtown, N. C.	20	1	4	°23.2	3
Broad: Blairs, S. C.	14	1	2	17.6	1
Santee: Rimini, S. C.	12	1	30	#	--
Pee Dee: Peedee, S. C.	19	3	7	20.3	5
EAST GULF OF MEXICO DRAINAGE					
Tombigbee: Lock No. 3, Whitfield, Ala.	33	18	22	39.2	20
Pearl: Jackson, Miss.	18	3-31	3	18.4	1
Bogalusa, La.	15	3-29	6	17.9	2
Pearl River, La.	12	4	6	12.2	5
MISSISSIPPI SYSTEM Upper Mississippi Basin					
Chippewa: Durand, Wisc.	11	29	30	12.9	29
MISSISSIPPI SYSTEM (Cont'd.) Upper Mississippi Basin (Cont'd.)					
Mississippi: Libby, Minn.	13	29	**	--	--
Aitken, Minn.	12	13	**	13.2	21
Ohio Basin					
Green: Woodbury, Ky., Lock No. 4	33	18	20	34.6	20
White: Edwardsport, Ind.	12	9	10	12.4	10
Arkansas Basin					
Verdigris: Coyville, Kans.	28	27	27	28.4	27
WEST GULF OF MEXICO DRAINAGE					
Sabine: Mineola, Tex.	14	19	20	14.9	19
East Fork (Trinity): Rockwall, Tex.	10	12	12	10.6	12
PACIFIC SLOPE DRAINAGE					
Sacramento: Colusa Weir, Calif.	61.8	5	8	63.8	6
Tisdale Weir, Calif.	45.5	6	12	47.5	7
Fremont Weir, Calif.	33.8	7	12	35.1	8

* Provisional
** Continued at end of month
# Affected by backwater
° Highest stage reported, but not necessarily the crest

RADIOSONDE DATA

Average monthly values

Table 20

APRIL 1954

Standard pressure surface (mb.)	ALBUQUERQUE, N. MEX. (837 MB.)				ATLANTA, GA. (986 MB.)				BISMARCK, N. DAK. (956 MB.)				BOISE, IDAHO (915 MB.)				BROWNSVILLE, TEX. (1015 MB.)				BOFFALO, N. Y. (997 MB.)				BORRWOOD, LA. (1019 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	1,619	17.8	22	30	309	17.2	72	30	505	4.6	64	30	868	11.9	43	30	7	22.8	85	30	221	6.2	80	30	3	21.6	87
1,000--	30	59			30	188			30	129			30	114			30	136	22.3	82	30	154	3.2		30	166	21.3	80
950----	30	520			30	628	17.5	62	30	555	3.7	60	30	553			30	584	19.8	80	30	580	7.2	66	30	610	18.8	73
900----	30	993			30	1,089	15.1	64	30	993	3.6	54	30	1,008	13.2	33	30	1,048	18.5	65	30	1,020	6.0	64	30	1,072	16.1	68
850----	30	1,484			30	1,571	11.9	68	30	1,454	1.4	55	30	1,485	9.9	33	30	1,537	17.1	45	30	1,486	3.8	59	30	1,557	13.8	55
800----	30	2,003	16.5		30	2,076	9.1	59	30	1,941	- .5	55	30	1,985	5.7	37	30	2,053	15.3	36	30	1,977	1.6	57	30	2,066	11.5	46
750----	30	2,551	12.2		30	2,613	6.0	56	30	2,461	- 3.4	54	30	2,513	1.4	43	30	2,600	12.4	36	30	2,498	- 1.4	59	30	2,608	8.8	38
700----	30	3,120	7.3	26	30	3,171	2.7	51	30	2,996	- 6.9	54	30	3,060	- 3.0	48	30	3,172	8.7	37	30	3,041	- 4.2	54	30	3,170	5.4	33
650----	30	3,722	1.9	31	30	3,772	- .8	49	30	3,579	-10.5	51	30	3,649	- 7.3	50	30	3,785	4.7	37	30	3,626	- 7.6	53	30	3,779	1.9	33
600----	30	4,364	- 3.6	36	30	4,402	- 4.6	42	30	4,182	-14.4	51	30	4,262	-11.5	52	30	4,429	.0	40	30	4,241	-11.2	51	30	4,413	- 2.1	33
550----	30	5,043	- 9.3	39	30	5,082	- 8.8		30	4,842	-18.7	52	30	4,928	-15.7	49	30	5,120	- 5.2	38	30	4,906	-15.3	47	30	5,099	- 6.6	33
500----	30	5,772	-15.0	40	30	5,814	-13.7		30	5,539	-23.7	50	30	5,635	-20.5	45	30	5,861	-10.3	35	30	5,617	-19.8	44	30	5,837	-11.4	
450----	30	6,567	-20.5		30	6,617	-18.8		30	6,311	-29.0	46	30	6,412	-26.1	44	30	6,672	-15.9	32	30	6,395	-25.3	46	30	6,653	-16.9	
400----	30	7,421	-26.9		30	7,475	-25.1		29	7,128	-35.0	43	30	7,248	-32.4	44	30	7,543	-22.2	33	30	7,235	-31.6		30	7,510	-23.2	
350----	30	8,369	-34.3		30	8,429	-32.6		29	8,045	-42.1		30	8,175	-39.6		29	8,508	-29.4		30	8,165	-38.7		30	8,473	-30.1	
300----	30	9,428	-42.7		29	9,495	-41.0		29	9,072	-49.2		30	9,211	-47.5		29	9,589	-37.9		30	9,205	-46.5		29	9,552	-38.8	
250----	30	10,632	-52.3		20	10,707	-50.4		28	10,245	-55.2		30	10,393	-55.7		28	10,816	-47.7		30	10,392	-54.5		29	10,777	-48.3	
200----	30	12,044	-61.2		20	12,129	-59.9		28	11,657	-57.7		30	11,794	-60.6		27	12,251	-58.7		28	11,808	-60.5		29	12,211	-58.2	
175----	30	12,869	-62.7		28	12,955	-63.1		28	12,500	-56.5		29	12,625	-59.4		26	13,078	-63.2		25	12,643	-62.3		29	13,044	-61.6	
150----	30	13,822	-61.1		27	13,898	-62.8		28	13,479	-55.4		29	13,593	-58.1		24	14,020	-65.4		22	13,607	-61.1		29	13,994	-63.1	
125----	29	14,949	-62.6		27	15,018	-64.2		26	14,646	-56.0		29	14,740	-58.5		23	15,119	-68.2		16	14,752	-59.8		28	15,108	-65.5	
100----	29	16,314	-64.8		26	16,374	-66.4		26	16,062	-56.4		28	16,137	-59.5		22	16,445	-71.1		14	16,137	-60.7		25	16,452	-68.2	
80-----	27	17,677	-65.3		26	17,720	-67.0		24	17,476	-56.3		23	17,535	[illegible]		21	17,761	-72.1		12	17,511	-59.8		22	17,783	-69.6	
60-----	26	19,437	-62.5		25	19,465	-64.1		21	19,308	-56.7		18	19,340	-58.1		15	19,457	-67.4		10	19,321	-59.8		18	19,512	-66.9	
50-----	24	20,561	-60.8		19	20,583	-60.7		18	20,468	-56.9		16	20,489	-58.5		13	20,567	-62.1		6	20,421	-60.1		17	20,618	-63.9	
40-----	18	21,963	-57.2		17	21,981	-56.2		9	21,871	-57.4		13	21,902	-56.7		12	21,965	-55.6						11	22,011	-57.8	
30-----	7	23,792	-52.0		12	23,815	-51.4		6	23,695	-57.3		5	23,778	-54.5		5	23,811	-51.3						5	23,855	-52.2	
20-----					6	26,493	-47.3																					

Standard pressure surface (mb.)	CARIBOU, ME. (995 MB.)				CHARLESTON, S. C. (1020 MB.)				COLUMBIA, MO. (989 MB.)				OODGE CITY, KANS. (923 MB.)				EL PASO, TEX. (880 MB.)				ELY, NEV. (808 MB.)				GLASGOW, MONT (939 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	191	1.0	69	30	13	17.4	90	30	238	15.0	58	30	792	14.7	48	30	1,195	21.5	23	30	1,908	9.5	36	30	648	4.2	58
1,000--	30	151	2.2		30	182	18.9	78	30	138			30	102			30	69			30	95			30	129		
950----	30	572	.7	58	30	629	17.5	70	30	579	14.8	55	30	543			30	530			30	540			30	555		
900----	30	997	- 1.7	56	30	1,084	15.0	62	30	1,030	12.5	59	30	1,004	15.8	44	30	1,006			30	1,001			30	993	3.5	51
850----	30	1,449	- 4.2	57	30	1,565	12.2	56	30	1,508	10.3	58	30	1,487	13.5	43	30	1,499	21.2	20	30	1,483			30	1,455	.4	53
800----	30	1,925	- 6.4	57	30	2,071	9.5	51	30	2,011	7.7	56	30	1,996	11.1	40	30	2,019	16.9	22	30	1,992	11.2	30	30	1,939	- 2.3	53
750----	30	2,435	- 8.6	58	30	2,613	6.5	47	30	2,543	4.5	54	30	2,535	8.1	36	30	2,570	12.2	22	30	2,526	7.7	31	30	2,452	- 5.2	56
700----	30	2,960	-11.0	52	30	3,167	3.2	44	30	3,099	1.5	43	30	3,097	4.6	35	30	3,136	7.5	23	30	3,090	2.7	37	30	2,987	- 8.5	59
650----	30	3,534	-14.3	49	30	3,771	- .3	41	30	3,692	- 2.6	38	30	3,697	.2	31	30	3,744	2.4	26	30	3,686	- 2.5	43	30	3,560	-12.5	59
600----	30	4,129	-17.6	48	30	4,400	- 4.3	42	30	4,322	- 6.9	41	30	4,332	- 4.7	31	30	4,381	- 2.7	31	30	4,314	- 7.7	45	29	4,162	-16.6	56
550----	29	4,787	-21.6	46	30	5,082	- 8.6	41	30	4,997	-11.2	40	30	5,010	- 9.8	32	30	5,062	- 8.0	33	30	4,985	-12.2	43	29	4,813	-20.7	57
500----	29	5,476	-25.7	43	30	5,812	-13.3	34	30	5,719	-16.5	37	30	5,738	-15 2	30	30	5,797	-13.4		30	5,707	-17.0	40	29	5,509	-25.4	55
450----	28	6,241	-30.4		30	6,615	-18.7	32	30	6,507	-22.3	38	30	6,530	-21.0		30	6,593	-19.4		30	6,493	-23.1	38	29	6,273	-30.8	51
400----	28	7,063	-35.9		30	7,474	-25.1	31	30	7,357	-28.4	38	30	7,385	-27.1		30	7,456	-25.8		30	7,340	-29.5	36	29	7,091	-36.6	49
350----	28	7,977	-42.6		30	8,429	-32.4		30	8,299	-35.7		30	8,332	-34.3		30	8,407	-33.4		29	8,280	-37.0		29	8,003	-42.9	
300----	28	9,001	-49.2		30	9,497	-40.9		30	9,352	-44.1		30	9,392	-42.3		29	9,469	-41.9		29	9,327	-45.3		29	9,026	-49.7	
250----	28	10,180	-54.8		30	10,709	-50.5		30	10,548	-53.6		30	10,599	-51.4		28	10,675	-51.1		29	10,518	-54.4		28	10,194	-54.7	
200----	28	11,590	-59.1		30	12,131	-60.2		29	11,953	-62.1		30	12,014	-61.1		24	12,101	-60.8		27	11,916	-61.5		26	11,618	-56.6	
175----	27	12,411	-58.4		30	12,957	-63.4		29	12,769	-64.5		30	12,837	-62.9		19	12,920	-63.1		26	12,739	-61.5		26	12,466	-55.4	
150----	25	13,364	-57.1		29	13,901	-63.4		28	13,713	-62.7		29	13,789	-61.2		18	13,867	-62.2		26	13,696	-60.2		25	13,447	-54.2	
125----	23	14,519	-56.1		28	15,017	-65.0		28	14,838	-62.4		29	14,919	-61.7		16	14,983	-64.1		24	14,832	-60.0		24	14,609	-54.6	
100----	22	15,922	-56.3		28	16,369	-67.3		26	16,199	-64.3		27	16,288	-63.8		10	16,348	-67.3		24	16,220	-61.3		24	16,034	-54.8	
80-----	18	17,335	-56.8		28	17,711	-67.6		24	17,567	-63.2		23	17,657	-62.5		10	17,688	-67.0		22	17,603	-61.7		21	17,458	-54.9	
60-----	16	19,150	-56.3		26	19,457	-63.4		21	19,337	-61.5		18	19,430	-62.1		9	19,427	-65.6		15	19,383	-60.0		18	19,307	-55.5	
50-----	15	20,317	-56.6		26	20,586	-59.6		21	20,469	-60.3		16	20,560	-60.1		8	20,542	-61.7		11	20,523	-59.4		16	20,465	-55.5	
40-----	5	21,795	-55.9		24	21,999	-54.7		20	21,869	-57.0		7	21,957	-57.6		6	21,941	-56.7		6	21,934	-57.0		11	21,901	-56.3	
30-----					21	23,838	-51.3		16	23,705	-54.3																	
20-----					7	26,496	-48.7		7	26,357	-49.6																	

Standard pressure surface (mb.)	GRAND JUNCTION, COLO. (851 MB.)				GREAT FALLS, MONT. (886 MB.)				GREEN BAY, WIS. (992 MB.)				GREENSBORO, N. C. (990 MB.)				HATTERAS, N. C. (1022 MB.)				HILO, T. H. (1014 MB.)				INTERNAT. FALLS, MINN. (972 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	1,474	14.5	28	30	1,128	2.8	56	30	210	6.4	66	30	273	14.9	75	30	3	16.6	86	30	9	24.7	72	30	360	0.9	65
1,000--	30	78			30	132			30	139	1.4		30	186			30	189	17.0	77	30	129	22.9	72	30	129		
950----	30	528			30	562			30	564	6.7	54	30	626	15.6	61	30	628	15.2	72	30	578	19.2	77	30	542	1.4	59
900----	30	997			30	1,001			30	1,004	4.4	57	30	1,081	13.4	61	30	1,083	12.6	64	30	1,038	15.9	80	30	977	- .8	59
850----	30	1,481	14.4		30	1,462	1.6	54	30	1,467	2.2	57	30	1,560	10.9	61	30	1,561	10.3	50	30	1,522	13.3	79	30	1,432	- 2.4	56
800----	30	1,994	13.6	22	30	1,948	- .9	57	30	1,955	.4	53	30	2,063	7.8	61	30	2,063	7.8	46	30	2,030	11.2	70	30	1,911	- 4.4	55
750----	30	2,535	8.9	25	30	2,467	- 3.7	60	30	2,475	- 2.1	46	30	2,598	5.0	57	30	2,596	4.8	45	30	2,575	9.2	49	30	2,422	- 6.7	54
700----	30	3,098	3.8	30	30	3,001	- 7.0	60	30	3,015	- 5.0	44	30	3,153	1.6	56	30	3,151	1.4	42	30	3,137	6.3	48	30	2,953	- 9.6	53
650----	30	3,696	- 1.5	37	30	3,580	-11.3	59	30	3,599	- 8.3	40	30	3,755	- 2.0	52	30	3,748	- 2.1	38	30	3,742	3.1	41	30	3,530	-12.7	49
600----	30	4,324	- 6.9	43	30	4,184	-15.6	57	30	4,212	-11.7	38	30	4,378	- 5.9	50	30	4,375	- 5.8	33	30	4,386	- .1	33	30	4,128	-16.2	48
550----	30	4,999	-12.2	45	30	4,837	-19.9	55	30	4,878	-16.0		30	5,062	-10.1	43	30	5,053	-10.0	32	29	5,083	- 4.5		30	4,781	-20.6	46
500----	30	5,718	-17.5	38	30	5,534	-24.9	51	30	5,584	-21.0		30	5,782	-14.8	43	30	5,780	-15.1		29	5,822	- 9.3		30	5,476	-25.3	45
450----	30	6,505	-23.1	35	30	6,296	-30.8	52	30	6,359	-26.5	37	30	6,581	-20.1	42	29	6,574	-20.3		29	6,637	-14.9		30	6,238	-30.8	46
400----	30	7,350	-29.3		30	7,117	-36.7	54	30	7,195	-32.2		30	7,434	-26.1	39	29	7,429	-26.2		29	7,510	-21.0		30	7,059	-36.4	48
350----	30	8,288	-36.9		30	8,027	-43.4		29	8,126	-39.2		30	8,385	-33.3	36	29	8,380	-33.3		29	8,481	-28.8		30	7,971	-43.0	
300----	30	9,334	-45.3		30	9,048	-50.4		29	9,164	-47.1		30	9,449	-41.6		29	9,443	-41.6		29	9,564	-37.4		30	8,992	-50.0	
250----	30	10,524	-54.6		30	10,220	-55.9		29	10,347	-55.0		30	10,658	-51.4		29	10,652	-51.3		28	10,794	-46.8		29	10,183	-54.8	
200----	30	11,926	-61.4		30	11,630	-57.7		29	11,751	-60.3		30	12,074	-61.0		29	12,068	-61.1		28	12,240	-56.7		29	11,600	-56.6	
175----	30	12,751	-61.6		29	12,466	-56.8		29	12,583	-60.0		29	12,891	-63.7		29	12,887	-64.0		27	13,077	-61.6		28	12,450	-55.7	
150----	29	13,708	-60.0		29	13,445	-55.7		28	13,545	-58.4		29	13,840	-62.9		28	13,835	-63.1		27	14,020	-66.7		28	13,433	-55.0	
125----	29	14,844	-60.4		29	14,603	-56.3		27	14,690	-58.6		26	14,960	-62.8		20	14,955	-64.2		26	15,109	-71.0		27	14,596	-55.3	
100----	27	16,223	-62.9		23	16,011	-56.0		25	16,083	-59.2		24	16,327	-64.6		26	16,314	-66.0		22	16,415	-73.6		25	16,022	-56.0	
80-----	23	17,594	-63.3		21	17,426	-56.0		25	17,478	-59.4		21	17,695	-64.7		24	17,662	-65.8		22	17,717	-73.3		22	17,433	-56.8	
60-----	18	19,368	-61.2		21	19,261	-56.6		20	19,283	-57.8		20	19,455	-62.1		20	19,421	-62.7		20	19,432	-67.1		18	19,247	-56.5	
50-----	15	20,499	-59.6		21	20,417	-57.3		13	20,461	-58.3		19	20,590	-59.2		17	20,550	-59.8		19	20,539	-63.9		15	20,408	-55.9	
40-----	13	21,913	-57.6		17	21,818	-56.6		8	21,899	-58.0		15	21,997	-55.8		9	21,945	-56.2		15	21,920	-59.8		6	21,798	-56.7	
30-----	7	23,749	-55.3		11	23,667	-55.3						11	23,838	-53.0						10	23,741	-56.3					

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

APRIL 1954

Standard pressure surface (mb.)	LAKE CHARLES, LA. (1018 MB.)				LANDER, WYO. (827 MB.)				LAS VEGAS, NEV. (935 MB.)				LITTLE ROCK, ARK. (1008 MB.)				MAZATLAN, MEXICO (1010 MB.)				MEDFORD, ORE (970 MB.)				MIAMI, FLA. (1019 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	5	20.4	83	30	1,696	8.6	37	30	660	23.4	16	30	79	18.7	66	30	14	23.5	79	30	401	13.8	55	30	4	24.0	77
1,000	30	158	20.3	78	30	84			30	65			30	148	19.6	59	30	97	23.4	70	30	142			30	168	23.0	75
950	30	601	18.3	70	30	529			30	524			30	591	18.4	55	30	563	26.1	22	30	579	14.5	43	30	614	20.0	75
900	30	1,063	16.2	65	30	989			30	992	23.0	17	30	1,051	15.2	58	30	1,023	24.6		30	1,030	11.0	47	30	1,079	17.0	74
850	30	1,547	13.6	59	30	1,464			30	1,485	18.7	20	30	1,533	12.2	65	30	1,521	21.7		30	1,504	7.1	52	30	1,564	14.0	72
800	30	2,057	11.9	44	30	1,969	8.6	29	30	2,000	14.0	24	30	2,040	9.9	56	30	2,043	18.2		30	1,999	3.4	53	30	2,074	11.4	63
750	30	2,603	9.2	39	30	2,504	4.3	32	30	2,544	9.2	28	30	2,580	7.1	49	30	2,598	14.4		30	2,525	.1	50	30	2,616	8.6	56
700	30	3,163	5.6	36	30	3,055	- .2	35	30	3,105	4.2	33	30	3,138	3.8	41	29	3,170	10.3		30	3,069	- 2.9	44	30	3,178	5.4	52
650	30	3,769	1.6	33	30	3,647	- 4.8	38	30	3,707	- .6	33	30	3,742	.2	39	24	3,792	6.3		30	3,658	- 6.1	40	30	3,786	1.9	51
600	30	4,405	- 2.5	33	30	4,267	- 9.2	36	30	4,336	- 5.4	30	30	4,373	- 3.4	33	23	4,436	1.4		30	4,275	- 9.7	38	30	4,422	- 1.7	47
550	30	5,089	- 7.0	34	30	4,936	-14.1	35	30	5,014	-10.4		30	5,058	- 7.8	31	20	5,136	- 3.7		30	4,943	-13.9	35	30	5,113	- 5.7	39
500	30	5,826	-12.1		30	5,648	-19.5	36	30	5,740	-15.6		29	5,787	-13.1		19	5,882	- 8.8		30	5,658	-18.8	32	30	5,850	-10.2	35
450	30	6,632	-17.2		30	6,429	-25.5	36	30	6,531	-21.8		29	6,587	-18.7		19	6,698	-14.4		30	6,443	-24.6	35	30	6,663	-15.4	33
400	30	7,496	-23.8		30	7,265	-32.0	35	30	7,381	-28.7		29	7,449	-25.0		19	7,572	-21.0		30	7,281	-30.6	35	30	7,534	-21.3	32
350	30	8,456	-31.1		30	8,192	-39.4		30	8,321	-36.4		29	8,405	-32.2		17	8,548	-28.5		30	8,215	-37.8		30	8,503	-28.8	
300	30	9,529	-39.3		30	9,228	-47.5		30	9,370	-44.7		29	9,474	-40.4		15	9,626	-37.2		30	9,259	-46.0		30	9,585	-37.5	
250	29	10,747	-49.3		30	10,409	-55.6		30	10,564	-53.7		29	10,690	-50.0		15	10,859	-47.2		30	10,447	-54.9		30	10,814	-47.5	
200	28	12,176	-59.6		28	11,805	-61.2		29	11,962	-62.1		28	12,115	-60.1		9	12,305	-58.6		30	11,847	-61.6		30	12,251	-58.1	
175	27	13,005	-63.0		28	12,632	-61.5		29	12,782	-63.3		28	12,937	-63.8		6	13,141	-63.9		20	12,672	-61.7		30	13,082	-62.0	
150	27	13,949	-63.9		28	13,592	-59.0		28	13,731	-61.5		27	13,886	-62.2						30	13,629	-59.9		30	14,026	-65.0	
125	27	15,062	-65.8		26	14,734	-59.3		28	14,858	-62.3		26	15,009	-63.5						30	14,768	-59.7		28	15,129	-68.4	
100	26	16,404	-68.9		26	16,130	-59.3		27	16,228	-63.8		25	16,371	-65.8						28	16,155	-60.2		27	16,450	-72.4	
80	24	17,736	-69.3		24	17,526	-59.5		26	17,596	-63.7		23	17,730	-65.9						25	17,547	-59.9		23	17,757	-72.9	
60	19	19,460	-67.2		22	19,323	-58.9		24	19,370	-62.4		18	19,483	-63.4						21	19,347	-58.1		18	19,451	-68.1	
50	17	20,569	-63.8		21	20,466	-58.1		21	20,497	-61.0		14	20,612	-60.7						19	20,500	-58.0		14	20,560	-61.6	
40	14	21,960	-56.9		15	21,881	-57.4		17	21,897	-58.3		11	22,005	-56.9						12	21,908	-57.3		13	21,961	-56.4	
30	6	23,828	-52.4		8	23,697	-56.6		14	23,720	-54.2		7	23,826	-53.0						8	23,756	-55.3		7	23,810	-51.3	
20									7	26,334	-49.8																	

Standard pressure surface (mb.)	MIDLAND, TEXAS (915 MB.)				NANTUCKET, MASS. (1020 MB.)				NASHVILLE, TENN. (999 MB.)				NORTH PLATTE, NEBR. (916 MB.)				OAKLAND, CALIF. (1017 MB.)				OKLAHOMA CITY, OKLA. (970 MB.)				OMAHA, NEBR. (981 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	871	19.5	48	30	14	6.3	85	30	177	17.2	70	30	848	10.3	57	30	6	14.6	73	30	391	17.6	68	30	300	13.0	57
1,000	30	95			30	178	8.0	73	30	166	14.2		30	105			30	146	13.7	72	30	125			30	131		
950	30	549			30	602	8.2	59	30	601	17.0	53	30	545			80	583	13.6	60	30	571	18.2	61	30	565	12.3	53
900	30	1,015	20.0	46	30	1,047	6.0	56	30	1,065	14.0	56	30	996	11.3	49	30	1,033	12.4	53	30	1,029	16.3	59	30	1,017	10.1	55
850	30	1,506	17.8	45	30	1,514	4.2	51	30	1,544	11.0	56	30	1,472	9.6	48	30	1,510	10.4	42	30	1,513	13.9	57	30	1,491	8.3	54
800	30	2,023	15.6	33	30	2,005	1.7	51	30	2,047	8.0	53	30	1,974	8.1	43	30	2,013	8.3	33	30	2,023	11.5	50	30	1,990	6.0	49
750	30	2,573	11.9	32	30	2,529	- .5	48	30	2,579	5.0	52	30	2,504	4.6	45	30	2,550	5.3	29	30	2,564	8.5	44	30	2,520	3.5	47
700	30	3,139	7.4	34	30	3,072	- 3.2	46	30	3,136	1.4	52	30	3,061	.9	48	30	3,102	1.7		30	3,126	4.9	40	30	3,074	.0	46
650	29	3,746	2.7	34	30	3,661	- 6.1	47	29	3,733	- 2.3	46	30	3,656	- 3.5	50	30	3,698	- 2.4	31	30	3,729	1.0	35	30	3,666	- 4.0	45
600	29	4,385	- 2.4	33	30	4,278	- 9.9	45	29	4,360	- 5.8	42	30	4,279	- 8.0	52	30	4,326	- 6.6		30	4,364	- 3.6	35	30	4,290	- 8.1	46
550	28	5,068	- 7.5	31	30	4,945	-14.3	49	29	5,039	- 9.8	38	30	4,951	-12.8	50	30	5,001	-11.1		30	5,046	- 8.6	36	30	4,962	-12.9	42
500	28	5,804	-12.8		30	5,659	-19.1	47	29	5,765	-14.8	38	30	5,668	-18.2	47	30	5,725	-16.4		30	5,776	-13.9		30	5,680	-18.1	37
450	27	6,608	-18.6		30	6,442	-24.7	47	29	6,558	-20.1	39	30	6,453	-23.7	43	30	6,517	-22.2		30	6,573	-19.4		30	6,467	-23.6	37
400	27	7,466	-25.0		30	7,282	-30.5	46	29	7,415	-26.3	39	30	7,296	-30.0	38	30	7,359	-28.6		30	7,431	-25.8	37	30	7,309	-29.7	38
350	27	8,421	-32.4		30	8,217	-37.0		29	8,366	-33.4		30	8,233	-37.0	39	30	8,304	-36.0		30	8,383	-33.1	35	30	8,246	-36.6	
300	27	9,488	-40.6		30	9,263	-45.2		29	9,431	-41.3		29	9,279	-45.2		30	9,355	-44.3		30	9,447	-41.5		30	9,295	-44.8	
250	26	10,706	-49.8		30	10,456	-53.5		29	10,643	-50.7		29	10,473	-53.6		30	10,551	-53.5		30	10,657	-50.5		30	10,491	-53.3	
200	25	12,135	-59.3		29	11,868	-61.4		29	12,065	-60.1		29	11,883	-60.9		30	11,956	-61.9		29	12,075	-60.5		29	11,903	-61.3	
175	25	12,964	-61.8		28	12,690	-62.7		28	12,890	-63.6		29	12,711	-61.4		30	12,779	-62.8		29	12,899	-63.4		24	12,740	-62.0	
150	24	13,919	-61.9		26	13,641	-61.5		27	13,836	-61.8		29	13,670	-59.9		30	13,731	-60.9		29	13,848	-62.2		21	13,703	-59.7	
125	22	15,044	-63.4		25	14,768	-59.9		26	14,960	-62.9		29	14,810	-59.9		30	14,862	-61.4		28	14,973	-63.0		21	14,844	-59.7	
100	20	16,401	-66.1		21	16,162	-61.1		26	16,327	-64.9		27	16,203	-61.5		30	16,241	-62.6		24	16,335	-65.3		20	16,229	-61.8	
80	14	17,749	-67.0		20	17,545	-60.3		21	17,679	-65.1		24	17,587	-61.3		30	17,616	-62.2		19	17,687	-65.1		16	17,614	-61.5	
60	11	19,490	-64.9		18	19,345	-57.9		16	19,446	-62.0		21	19,385	-60.1		30	19,401	-60.3		16	19,444	-64.1		13	19,422	-59.6	
50	8	20,623	-59.9		17	20,502	-57.9		14	20,580	-60.5		20	20,525	-59.7		29	20,536	-59.3		12	20,568	-60.4		12	20,567	-58.4	
40	5	22,026	-55.3		11	21,947	-55.3		10	21,986	-57.1		18	21,936	-57.4		22	21,949	-57.5		7	21,979	-55.6		11	21,980	-56.3	
30					7	23,767	-54.0		6	23,831	-53.2		8	23,761	-55.6		16	23,776	-55.0						6	23,829	-54.7	

Standard pressure surface (mb.)	PHOENIX, ARIZ. (972 MB.)				PITTSBURGH, PA. (975 MB.)				PORTLAND, ME. (1018 MB.)				RAPID CITY, S. DAK. (904 MB.)				ST. CLOUD, MINN. (978 MB.)				SAN ANTONIO, TEX. (988 MB.)				SAN JUAN, P. R. (1016 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	341	25.2	25	30	382	12.1	66	30	20	4.8	77	30	966	6.7	58	30	316	5.3	61	30	243	22.6	62	30	19	24.3	76
1,000	30	88			30	164			30	166	6.1	64	30	120			30	130			30	135			30	156	23.4	75
950	30	543	27.1	15	30	597	12.4	60	30	587	5.0	55	30	551			30	554	5.9	52	30	583	19.9	65	30	603	20.2	79
900	30	1,016	23.0	15	30	1,048	10.1	60	30	1,026	3.2	56	30	999	6.5	55	30	992	3.7	54	30	1,046	16.8	68	30	1,068	16.9	79
850	30	1,508	18.5	17	30	1,521	7.3	61	30	1,487	1.5	58	30	1,470	6.1	51	30	1,455	2.1	50	30	1,532	14.5	66	30	1,554	13.9	73
800	30	2,023	14.1	18	30	2,018	5.1	54	30	1,973	- 1.3	54	30	1,964	3.6	53	30	1,942	- .2	49	30	2,043	12.8	53	30	2,064	11.7	64
750	30	2,571	9.7	20	30	2,547	2.3	56	30	2,493	- 3.5	46	30	2,491	.8	50	30	2,464	- 2.8	49	30	2,588	10.9	39	30	2,606	9.6	53
700	30	3,130	5.1	22	30	3,097	- 1.0	55	30	3,028	- 6.2	39	30	3,037	- 2.7	49	30	3,000	- 5.7	48	30	3,154	7.3	34	30	3,173	7.3	40
650	30	3,734	.5		30	3,690	- 4.3	51	30	3,611	- 9.1	39	30	3,621	- 6.7	50	30	3,585	- 9.2	48	30	3,765	3.0	37	30	3,785	4.3	
600	30	4,367	- 4.1		30	4,312	- 8.4	51	30	4,221	-12.3	41	30	4,241	-11.3	49	30	4,192	-13.1	48	30	4,402	- 1.6	37	30	4,427	.5	
550	30	5,048	- 8.6		30	4,984	-12.6	48	29	4,887	-16.7	44	30	4,901	-16.0	49	30	4,851	-17.8	46	29	5,087	- 6.3	37	30	5,121	- 3.3	
500	30	5,778	-14.0		30	5,702	-17.6	46	29	5,592	-21.9	43	30	5,614	-20.8	45	30	5,557	-22.6	42	29	5,828	-11.6	34	30	5,868	- 7.7	
450	30	6,575	-20.1		29	6,487	-23.0	45	29	6,364	-27.2	44	30	6,387	-26.4	43	30	6,330	-28.3	42	28	6,635	-17.3		30	6,694	-12.9	
400	30	7,429	-26.9		29	7,334	-29.0	39	29	7,198	-32.9	45	30	7,224	-32.6	39	30	7,159	-34.0	42	28	7,501	-23.4		30	7,569	-19.0	
350	30	8,376	-34.6		29	8,275	-35.8		29	8,124	-39.6		30	8,151	-39.6		30	8,080	-41.2		28	8,462	-30.8		30	8,548	-26.1	
300	30	9,434	-42.9		29	9,329	-43.8		29	9,160	-47.1		30	9,187	-47.3		30	9,109	-48.8		28	9,537	-39.2		29	9,644	-34.2	
250	30	10,636	-52.3		29	10,528	-52.9		29	10,344	-54.7		30	10,370	-55.2		30	10,287	-55.7		27	10,762	-48.8		29	10,895	-43.6	
200	30	12,051	-60.2		29	11,939	-60.8		29	11,749	-60.6		29	11,775	-59.9		30	11,694	-58.9		27	12,194	-59.1		29	12,357	-55.0	
175	30	12,879	-61.5		28	12,760	-63.1		28	12,591	-61.8		29	12,609	-59.1		30	12,528	-58.8		27	13,023	-62.8		29	13,197	-61.1	
150	30	13,835	-60.8		27	13,722	-62.0		28	13,550	-59.4		28	13,577	-57.9		30	13,501	-57.1		25	13,964	-64.5		29	14,138	-67.6	
125	30	14,965	-62.3		25	14,846	-61.3		28	14,691	-59.3		28	14,725	-58.4		29	14,648	-57.6		24	15,076	-65.4		28	15,222	-72.5	
100	30	16,334	-64.6		22	16,240	-62.1		26	16,100	-59.9		28	16,123	-59.3		28	16,043	-58.4		20	16,421	-69.1		25	16,522	-76.0	
80	30	17,696	-64.5		21	17,620	-61.4		23	17,494	-59.0		27	17,522	-58.5		27	17,440	-58.7		16	17,743	-69.8		24	17,805	-77.8	
60	29	19,459	-62.7		20	19,403	-59.5		22	19,304	-57.9		25	19,325	-58.4		24	19,255	-58.1		12	19,459	-67.6		21	19,469	-71.1	
50	29	20,587	-60.8		18	20,562	-59.4		18	20,463	-57.1		19	20,469	-58.4		22	20,400	-57.8		9	20,573	-63.0		18	20,567	-63.3	
40	24	21,991	-56.6		18	21,963	-57.6		17	21,883	-55.7		11	21,888	-58.0		16	21,800	-58.3		8	21,954	-57.5		13	21,959	-58.9	
30	19	23,832	-52.4		7	23,817	-54.6		7	23,686	-55.4						12	23,623	-57.4		6	23,796	-53.2		8	23,763	-55.5	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

APRIL 1954

Standard pressure surface (mb.)	SANTA MARIA, CALIF. (1009 MB.)				S. STE. MARIE, MICH. (991 MB.)				SPOKANE, WASH. (930 MB.)				SWAN ISLAND, W. I. (1014 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	71	12.2	85	30	221	1.5	83	30	722	7.7	47	30	10	25.9	80
1,000	30	142	11.8	82	30	149			30	121			30	134	25.3	80
950	30	579	13.3	71	30	568	2.5	65	30	550			30	586	22.1	81
900	30	1,029	14.0	52	30	999	.4	65	30	995	6.8	43	30	1,053	19.2	76
850	30	1,509	11.5	46	30	1,456	- .7	62	30	1,461	3.0	46	30	1,542	16.3	72
800	30	2,013	9.1	36	30	1,939	- 2.5	57	30	1,949	- 1.0	49	30	2,056	13.6	69
750	30	2,555	6.7	23	30	2,456	- 5.0	54	30	2,462	- 4.8	54	30	2,601	10.6	62
700	30	3,108	3.2		30	2,989	- 8.0	49	30	2,999	- 8.6	57	30	3,170	7.9	54
650	30	3,707	- .4		30	3,570	-10.8	45	30	3,573	-12.1	51	30	3,785	5.2	38
600	30	4,339	- 4.7	19	30	4,173	-14.7	44	30	4,178	-15.9	45	30	4,428	2.0	
550	30	5,018	- 9.7		30	4,831	-18.7	39	30	4,828	-20.0	43	30	5,125	- 1.4	
500	30	5,746	-14.9		30	5,531	-23.3	40	30	5,520	-24.5	43	30	5,879	- 6.2	
450	30	6,544	-20.7		30	6,304	-28.4		30	6,288	-29.9	42	30	6,702	-11.8	
400	30	7,394	-27.4		30	7,129	-34.1		30	7,115	-36.0	43	30	7,587	-17.9	
350	30	8,339	-35.2		29	8,070	-40.5		30	8,029	-42.5		30	8,571	-25.2	
300	30	9,393	-43.9		29	9,103	-47.9		30	9,053	-49.5		30	9,670	-33.6	
250	30	10,591	-53.0		26	10,285	-54.6		30	10,229	-55.6		30	10,922	-43.7	
200	30	12,000	-61.5		21	11,707	-58.4		30	11,638	-57.7		30	12,382	-55.2	
175	29	12,824	-62.9		17	12,539	-58.3		30	12,483	-55.9		30	13,222	-61.2	
150	29	13,775	-61.7		12	13,513	-56.3		30	13,464	-55.3		29	14,163	-66.9	
125	29	14,903	-62.2		6	14,727	-55.5		28	14,630	-55.5		25	15,248	-70.9	
100	28	16,272	-63.7						28	16,047	-56.6		25	16,554	-75.4	
80	27	17,637	-62.6						24	17,451	-55.3		24	17,839	-76.4	
60	27	19,415	-61.5						19	19,300	-55.2		22	19,511	-70.3	
50	26	20,551	-60.3						18	20,463	-55.2		22	20,611	-63.6	
40	22	21,960	-57.0						10	21,883	-53.3		22	22,001	-58.0	
30	11	23,812	-53.9						6	23,713	-53.8		20	23,828	-54.5	
20													11	26,457	-49.1	

Standard pressure surface (mb.)	TACUBAYA, MEXICO (775 MB.)				TAMPA, FLA. (1020 MB.)				TATOOSH ISLAND, WASH. (1015 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	22	2,306	18.4	45	30	7	21.6	83	30	31	7.0	80
1,000	22	48			30	176	22.0	78	30	151	6.0	78
950	22	514			30	622	19.7	74	30	573	3.1	78
900	22	995			30	1,086	16.6	74	30	1,006	.4	73
850	22	1,494			30	1,571	13.6	73	30	1,462	- 2.1	66
800	22	2,028			30	2,080	10.8	69	30	1,941	- 4.9	61
750	22	2,583	16.0	43	30	2,624	8.2	61	30	2,452	- 7.3	49
700	22	3,162	11.3	47	30	3,183	5.0	57	30	2,981	-10.1	49
650	22	3,700	6.2	54	30	3,793	1.4	50	30	3,557	-13.0	50
600	22	4,426	1.3	61	30	4,424	- 2.2	38	30	4,155	-16.2	52
550	22	5,121	- 3.8	70	30	5,115	- 6.4	34	30	4,807	-20.4	47
500	22	5,867	- 8.7	74	30	5,849	-10.8	29	29	5,503	-24.9	48
450	21	6,681	-13.8		30	6,662	-16.4	30	29	6,268	-30.1	48
400	20	7,560	-19.5		30	7,526	-22.4		29	7,090	-35.6	46
350	15	8,544	-27.0		30	8,492	-29.9		29	8,005	-42.0	
300	10	9,647	-35.4		30	9,570	-38.4		29	9,033	-48.9	
250	5	10,891	-44.8		30	10,797	-47.8		29	10,212	-55.1	
200					30	12,235	-57.6		29	11,623	-58.0	
175					30	13,069	-61.7		29	12,466	-56.9	
150					30	14,016	-64.3		28	13,449	-55.8	
125					29	15,125	-66.0		27	14,605	-55.5	
100					28	16,465	-69.6		27	16,024	-56.4	
80					27	17,789	-70.7		27	17,440	-56.6	
60					23	19,500	-67.7		22	19,265	-55.5	
50					19	20,601	-63.4		20	20,422	-55.4	
40					18	21,995	-57.2		15	21,856	-55.6	
30					17	23,833	-52.5		7	23,680	-55.5	
20					5	26,499	-47.1					

Standard pressure surface (mb.)	VERACRUZ, MEXICO (1012 MB.)				WASHINGTON, D. C. (1011 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	13	25.6	82	30	88	13.0	68
1,000	30	114	24.9	81	30	182	12.9	65
950	30	561	23.3	65	30	619	12.2	65
900	30	1,035	20.7	58	30	1,065	10.0	66
850	30	1,527	17.9	61	30	1,539	7.8	67
800	30	2,043	14.7	59	30	2,038	5.6	58
750	30	2,585	11.7	52	30	2,571	2.9	55
700	29	3,162	9.0	35	30	3,119	- .3	54
650	29	3,776	5.3	32	29	3,710	- 3.9	52
600	28	4,421	1.0	36	29	4,334	- 8.0	48
550	26	5,113	- 3.4		29	5,008	-12.1	43
500	23	5,862	- 7.7		29	5,728	-16.9	44
450	23	6,683	-13.1		29	6,520	-22.4	
400	23	7,562	-19.3		29	7,365	-28.5	
350	21	8,538	-26.4		29	8,307	-35.8	
300	17	9,634	-34.5		29	9,359	-44.0	
250	12	10,888	-43.9		29	10,558	-52.9	
200	9	12,353	-55.9		28	11,967	-61.2	
175	8	13,195	-61.7		28	12,789	-64.1	
150	7	14,151	-66.3		28	13,733	-62.9	
125	6	15,253	-71.1		27	14,856	-62.6	
100					23	16,224	-63.6	
80					21	17,587	-63.1	
60					19	19,361	-61.3	
50					16	20,504	-59.5	
40					15	21,914	-57.0	
30					13	23,753	-54.3	

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Table 21

APRIL 1954

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)			* Buffalo, N. Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S. C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)			Ely, Nev. (1,910 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	186	3.8	30	215	2.4	29	323	1.6	27	300	2.6	30	313	2.1	30	132	7.8	29	246	2.2	27	277	1.8	29	147	2.8	27	215	3.7	30	236	3.0	29	231	2.0
500	--	---	----	--	---	----	--	---	----	--	---	----	--	---	----	28	145	7.9	28	240	5.6	27	233	3.6	29	146	3.1	27	219	5.1	--	---	----	--	---	----
1,000	30	190	5.7	--	---	----	--	---	----	27	290	3.4	30	314	2.2	22	156	7.4	27	249	9.0	26	248	5.0	26	183	1.5	26	229	6.3	--	---	----	--	---	----
1,500	28	197	6.6	--	---	----	29	296	2.0	24	272	4.8	30	286	2.6	20	167	5.6	27	250	10.6	24	262	8.3	23	234	2.1	24	241	7.0	30	251	3.0	--	---	----
2,000	21	226	7.2	30	221	3.3	26	268	3.8	20	280	8.1	29	274	4.4	17	178	4.6	27	254	12.0	19	284	9.0	20	273	2.2	24	251	8.2	30	248	3.3	29	241	2.2
2,500	17	239	6.6	30	235	3.7	23	262	7.3	18	289	10.5	28	271	6.3	15	184	3.9	27	261	14.1	17	295	11.2	20	283	2.9	19	269	10.3	29	248	4.1	28	244	2.8
3,000	15	254	7.3	30	250	5.5	19	263	9.1	16	282	11.1	26	264	8.9	14	197	3.3	28	269	15.8	14	292	13.0	14	275	3.4	17	272	12.9	29	252	5.0	27	250	3.8
4,000	13	273	8.8	30	256	8.0	16	272	14.3	13	266	15.8	25	274	12.1	13	262	4.2	26	269	19.1	11	281	16.9	13	281	6.5	14	281	14.8	28	245	8.3	24	258	6.2
5,000	12	282	9.0	28	257	10.5	11	281	18.1	10	265	17.4	23	282	15.3	13	261	6.2	25	270	21.3				13	276	8.3	14	284	19.0	26	249	10.2	22	277	8.4
6,000	11	295	9.7	26	262	12.7							19	285	16.5	12	265	6.8	24	274	24.9				12	282	6.9	10	276	18.2	23	259	10.9	19	277	11.6
8,000				20	270	14.7							15	281	21.9				24	277	28.2										20	266	12.8	10	279	19.3
10,000				11	271	18.4							10	288	26.8				22	278	32.1										16	274	17.9			
12,000																			21	278	33.5										11	273	19.6			
14,000																			19	274	27.3															
16,000																			16	274	19.0															

	Grand Junction, Colo. (1,475 m.)			Green Bay, Wis. (210 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Little Rock, Ark. (88 m.)			Medford, Ore. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			Oakland, Calif. (8 m.)			Omaha, Nebr. (306 m.)		
Surface	30	277	3.0	28	239	1.9	29	207	2.0	28	292	2.7	29	95	4.8	29	191	2.9	29	335	1.4	30	107	4.1	30	171	3.5	28	203	2.4	30	257	3.8	28	238	0.7
500	--	---	----	28	248	3.0	29	207	3.7	--	---	----	29	103	4.8	29	192	4.6	29	330	1.7	30	104	5.8	30	175	3.4	28	204	3.9	30	266	2.5	28	248	.9
1,000	--	---	----	27	251	5.6	29	206	4.8	28	285	3.7	23	144	2.7	27	200	5.1	29	299	2.0	29	98	4.8	27	176	2.3	28	209	5.4	27	317	1.4	24	241	1.7
1,500	30	276	2.9	23	251	8.0	26	226	4.9	27	269	6.2	22	174	1.5	26	216	6.3	27	268	2.1	28	92	3.4	19	201	.3	28	226	6.2	26	314	2.0	22	246	5.1
2,000	30	275	3.7	21	267	8.3	23	249	5.3	21	267	10.5	20	255	2.0	19	231	7.4	24	265	2.8	25	85	1.6	15	253	1.2	24	232	6.4	24	317	2.9	21	256	6.6
2,500	30	260	3.8	17	273	10.6	22	269	6.5	16	270	13.4	20	274	2.0	17	252	7.7	24	273	3.7	23	74	.9	13	289	2.3	22	243	7.1	23	304	3.7	20	258	8.6
3,000	29	247	5.5	15	270	13.1	21	277	7.9	13	271	13.1	20	279	2.7	13	249	7.8	24	287	5.7	23	134	1.1				21	257	6.4	23	302	5.0	19	268	10.6
4,000	26	256	8.6	12	279	18.5	17	278	8.4	11	274	17.0	18	270	4.1	12	263	8.5	20	287	9.2	15	239	2.8				18	269	9.5	22	306	7.0	16	268	16.1
5,000	19	267	14.4	12	278	22.9	16	273	12.6				18	268	5.5				18	283	12.1	12	276	5.3				15	279	12.0	20	289	8.6	13	270	19.7
6,000	17	272	17.4	11	274	26.0	14	275	13.1				18	275	8.0				17	286	13.6	10	284	5.5				15	282	14.8	20	284	9.4			
8,000	14	281	21.9										13	281	11.2				15	286	17.0							11	274	12.8	14	293	12.4			
10,000																			11	297	20.0															
12,000																			10	291	21.1															

	Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			** Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (725 m.)			# Washington, D.C. (88 m.)		
Surface	30	232	0.8	30	359	3.3	29	276	2.1	29	161	1.7	30	148	3.9	30	278	3.3	30	281	0.9	30	224	4.8	30	185	1.9
500	30	229	1.3	--	---	----	29	272	2.1	29	189	2.5	30	149	4.5	26	289	2.3	30	242	1.9	--	---	----	30	201	2.8
1,000	30	214	2.0	30	358	3.4	22	237	3.3	28	208	4.2	30	158	5.0	22	309	1.5	30	241	5.1	30	233	6.8	30	231	5.1
1,500	30	203	2.4	30	337	4.0	22	258	6.7	28	229	6.0	26	175	4.9	22	314	1.8	30	251	8.8	29	237	7.9	30	251	7.5
2,000	30	206	3.1	24	274	2.5	21	266	9.4	25	243	7.2	16	201	3.7	21	308	2.2	30	264	11.7	22	248	8.7	30	260	10.1
2,500	30	220	3.2	21	256	6.7	18	283	13.4	24	255	9.2	14	227	4.1	21	298	3.1	30	271	14.7	19	253	10.3	30	272	11.4
3,000	30	227	3.7	20	263	8.7	16	278	15.6	19	272	13.1	13	240	4.7	21	297	3.3	30	269	16.5	15	264	10.3	30	273	13.1
4,000	28	234	5.5	14	272	13.5	14	277	20.1	16	272	15.7	12	253	7.7	20	280	5.6	30	272	19.6	10	274	16.5	29	280	15.9
5,000	26	251	8.1	11	275	15.1	13	280	23.9	14	278	18.2	11	261	9.6	19	276	8.6	30	274	23.8				29	281	17.9
6,000	24	264	9.4				12	275	23.9	11	281	23.3	10	270	11.0	19	278	10.3	30	277	29.2				29	283	18.7
8,000	20	275	10.5													13	262	10.1	30	275	35.7				29	276	23.2
10,000	14	275	14.6																30	274	37.5				29	276	26.9
12,000																			13	273	37.3				28	277	30.2
14,000																			10	279	34.6				27	277	29.8
16,000																									27	285	23.1

* Rawin Data (Cont'd)
18,000 m., 15 obs. 277 dir., 13.3 speed
20,000 m., 11 obs. 269 dir., 8.6 speed

** Rawin Data

# Rawin Data (Cont'd)
18,000 m., 25 obs. 291 dir., 14.1 speed
20,000 m., 22 obs. 287 dir., 8.7 speed
22,000 m., 21 obs. 279 dir., 8.1 speed
24,000 m., 10 obs. 277 dir., 5.3 speed

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

RAWIN DATA

Average monthly resultant winds

Table 22

APRIL 1954

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S. C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N. C. (275 m.)			Hatteras, N. C. (3 m.)			Int. Falls, Minn. (358 m.)			Little Rock, Ark. (80 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface----------	30	105	0.6	30	9	1.3	30	115	5.8	30	125	2.6	30	262	3.1	30	126	1.3	30	83	1.4	30	10	2.0	30	185	0.8	30	156	0.8	29	88	0.0	30	162	1.4
500-------------	--	---	----	--	---	----	30	143	9.5	30	129	3.4	30	265	4.4	30	167	4.4	30	152	1.7	--	---	----	30	199	3.2	29	202	5.2	28	225	.5	30	191	4.9
1,000-----------	--	---	----	30	305	3.0	30	157	9.0	30	132	2.6	29	276	7.4	30	179	4.0	30	212	4.7	--	---	----	30	231	5.8	29	221	5.8	28	260	4.7	29	211	6.5
1,500-----------	--	---	----	30	279	6.1	30	167	7.4	30	111	2.2	29	283	9.7	30	208	2.5	30	226	6.8	30	4	1.9	30	241	6.6	29	243	5.3	27	276	7.2	29	228	7.4
2,000-----------	30	257	3.5	30	284	8.9	30	175	5.7	30	110	1.4	29	282	11.0	30	249	2.5	30	236	9.1	30	278	2.5	30	249	7.3	29	261	5.4	27	282	9.7	29	243	7.2
2,500-----------	30	257	6.2	30	286	11.2	30	189	4.4	30	167	.3	30	278	13.1	29	253	2.2	30	242	10.2	30	266	4.3	29	268	7.8	28	274	5.6	27	287	12.2	27	256	6.1
3,000-----------	30	260	7.4	30	284	13.0	30	212	3.9	30	257	1.4	28	281	14.8	28	279	2.6	30	254	11.4	30	258	5.5	28	273	8.9	29	271	7.4	26	284	12.9	26	266	5.7
4,000-----------	30	256	8.6	29	280	16.4	30	235	4.4	29	270	4.4	26	282	17.9	28	283	3.9	30	267	13.9	30	254	8.3	28	277	8.1	27	277	7.7	28	279	17.3	25	263	7.0
5,000-----------	30	259	9.8	25	271	18.5	30	263	6.7	29	275	7.7	20	294	21.0	27	285	6.0	30	267	16.2	30	258	11.9	27	282	9.3	26	273	9.0	26	273	19.3	24	277	8.5
6,000-----------	30	264	11.0	24	262	21.4	30	272	7.8	29	281	10.6	17	301	26.6	27	281	7.8	30	269	18.3	30	264	15.0	26	283	10.8	25	281	10.7	22	271	23.0	23	279	9.6
8,000-----------	28	268	14.1	17	262	22.1	28	271	12.4	29	274	13.6				27	281	11.5	30	270	21.0	28	271	21.7	24	274	12.8	22	287	10.8	17	269	27.6	20	269	12.1
10,000----------	24	260	16.0	11	245	24.0	26	270	16.7	28	276	17.6				25	286	14.2	28	262	20.1	15	248	20.1	21	270	13.6	22	290	15.5	12	263	31.8	16	269	14.2
12,000----------	18	258	19.1				17	267	19.1	26	275	22.9				22	286	15.5	26	262	31.9				18	279	15.8	20	284	16.6				13	280	15.6
14,000----------	13	267	21.1				12	263	19.0	22	276	19.2				19	278	19.3	25	267	30.5				18	279	20.4	16	284	20.8				11	271	19.6
16,000----------										20	269	16.5				17	292	14.2	23	270	24.7				15	277	15.9	15	291	14.9						
18,000----------										15	280	8.7				15	306	6.4	19	273	12.8				13	275	9.4	13	295	7.1						
20,000----------										13	245	1.6				15	280	4.1	15	260	8.2				11	290	7.0	11	295	5.7						
22,000----------																14	270	2.1	12	262	5.1															
24,000----------																12	291	4.5																		

	Medford, Ore. (401 m.)			Miami, Fla. (12 m.)			Midland, Tex. (871 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma, City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			St. Cloud, Minn. (318 m.)			San Antonio Tex. (242 m.)			San Juan, P. R. (28 m.)			Santa Maria, Calif. (72 m.)		
Surface----------	30	322	2.0	30	93	2.9	30	144	1.6	29	213	1.9	30	194	1.6	30	265	3.0	30	151	3.1	30	1	1.6	30	320	0.5	29	144	4.9	30	96	5.0	30	270	2.8
500-------------	30	323	2.5	30	111	5.9	--	---	----	27	240	5.1	29	210	5.3	30	279	4.0	28	155	4.2	--	---	----	30	222	.7	29	143	7.9	30	86	8.9	30	344	2.8
1,000-----------	30	306	3.0	30	107	5.9	30	159	3.0	26	260	7.1	29	211	6.4	30	277	3.0	28	186	9.0	30	357	1.9	30	248	3.3	29	157	6.9	30	85	8.6	30	9	2.9
1,500-----------	30	264	3.0	30	106	4.7	30	179	4.7	25	267	8.0	30	221	6.9	30	277	2.3	27	205	9.1	30	315	3.4	29	256	5.9	29	183	4.9	30	77	7.1	30	7	2.8
2,000-----------	30	238	4.4	30	99	3.7	29	213	4.9	25	269	10.1	30	234	7.7	30	291	2.9	27	234	7.5	30	281	5.4	28	266	7.8	29	203	4.5	29	69	5.6	29	2	2.4
2,500-----------	30	247	6.4	30	99	2.5	29	231	5.2	25	274	12.3	29	250	7.4	30	287	3.4	27	246	7.8	30	273	8.0	28	271	9.8	29	222	4.0	29	73	4.2	29	317	2.3
3,000-----------	30	262	8.6	30	113	1.3	29	241	6.1	25	275	14.4	29	256	7.2	30	287	5.1	29	264	8.1	30	276	11.0	28	277	11.4	29	235	4.9	29	79	2.3	29	297	3.3
4,000-----------	30	269	11.8	30	300	.8	29	261	7.5	23	278	17.9	28	267	8.5	30	284	6.5	28	274	9.7	30	274	16.3	27	272	15.2	29	250	6.7	29	85	.7	29	280	5.8
5,000-----------	29	278	14.7	30	286	2.5	28	270	9.5	19	284	19.1	27	276	10.2	30	283	8.9	28	274	10.6	30	276	19.0	25	263	17.4	28	256	8.4	29	305	1.6	29	287	8.5
6,000-----------	26	279	18.3	30	283	5.4	27	272	10.0	16	292	20.0	24	275	9.9	30	282	10.9	28	270	12.5	27	270	21.3	25	263	20.3	28	261	10.9	29	287	4.5	28	279	9.0
8,000-----------	20	278	21.3	30	281	11.8	27	257	13.8	11	293	19.3	23	267	13.3	26	284	14.6	27	266	16.3	18	259	23.4	21	258	21.0	26	262	15.1	29	285	11.0	26	291	10.7
10,000----------	10	285	18.8	30	280	17.3	23	264	17.1				22	267	17.1	23	287	17.3	26	256	20.3	10	245	25.4	20	256	25.8	22	265	18.7	29	277	21.4	25	288	13.8
12,000----------				30	278	23.9	20	253	20.5				10	280	19.4	12	286	13.5	22	250	22.9				15	256	24.0	19	267	19.6	29	266	30.5	20	275	18.3
14,000----------				28	276	21.6	18	260	21.4				14	270	18.8				19	264	24.8							17	265	26.6	27	270	30.0	17	269	16.5
16,000----------				20	280	15.3	11	265	16.8				10	271	15.5				13	265	22.1							10	257	18.7	19	287	18.1	16	274	13.0
18,000----------				11	310	6.6																									18	299	5.7	14	282	10.4
20,000----------																															14	332	3.5	14	297	7.0
22,000----------																															11	101	2.3	12	296	4.3

	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is. Wash. (33 m.)			Washington, D. C. (88 m.)		
Surface----------	29	197	0.2	30	223	3.4	30	241	3.9	30	170	1.6
500-------------	29	292	.7	--	---	----	30	244	5.8	30	215	6.1
1,000-----------	29	286	3.9	29	245	5.8	30	241	6.3	30	240	8.2
1,500-----------	29	278	7.9	29	247	8.9	30	248	6.7	30	256	8.9
2,000-----------	29	282	10.5	28	252	9.6	30	253	7.7	30	268	9.6
2,500-----------	29	282	12.2	27	259	10.7	30	265	8.8	30	276	10.5
3,000-----------	29	281	14.7	26	263	10.9	30	273	11.3	30	278	11.9
4,000-----------	29	277	17.3	24	266	14.2	28	278	16.5	29	279	13.9
5,000-----------	29	272	21.2	20	281	17.9	26	275	20.0	29	279	16.5
6,000-----------	29	275	25.4	16	285	18.1	19	270	23.7	29	276	17.8
8,000-----------	28	273	35.8	10	286	20.2	11	267	23.0	29	283	24.6
10,000----------	25	270	38.9							29	280	29.8
12,000----------	20	270	37.8							28	280	32.7
14,000----------										27	281	31.9
16,000----------										23	279	26.7
18,000----------										21	279	16.5
20,000----------										17	281	11.3
22,000----------										15	276	7.2
24,000----------										13	269	8.8

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following Table 22 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun. APRIL 1954

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
TABLE MOUNTAIN, CALIF.									
	Air mass								
	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76
Apr.									
12-----	0.87	1.00	1.13	1.28	----	----	----	----	----
13-----	----	----	----	1.36	----	----	----	----	----
20-----	----	----	----	1.41	----	----	----	----	----
21-----	.96	1.06	1.19	1.34	----	----	----	----	----
22-----	----	----	----	1.31	----	----	----	----	----
25-----	----	----	----	1.37	----	----	----	----	----
Averages	(.92)	(1.03)	(1.16)	1.35	----	----	----	----	----
Departures	-.05	-.09	-.11	-.12	----	----	----	----	----
ALBUQUERQUE, N. MEX.									
	Air mass								
	4.08	3.26	2.44	1.63	*1.0	1.63	2.44	3.26	4.08
	NO DATA DURING APRIL 1954								
MADISON, WISCONSIN									
	Air mass								
	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81
Apr.									
1------	0.86	0.97	1.09	1.21	----	----	----	----	----
3------	.85	.97	----	----	----	----	----	----	----
#6-----	----	----	----	----	----	1.03	0.75	0.63	----
8------	----	.96	1.07	1.25	1.50	1.27	1.08	.94	0.82
11-----	.60	.70	.88	1.21	1.45	1.14	.92	.78	.65
12-----	.84	.96	1.09	1.28	1.51	1.20	1.03	.86	.75
#13----	----	----	----	----	----	1.00	.78	.63	.53
16-----	----	----	----	----	1.51	1.19	1.01	.84	.69
17-----	----	----	----	----	----	1.18	1.00	.89	.78
22-----	----	----	----	----	----	1.24	1.04	.88	.75
23-----	----	----	----	----	1.47	1.09	.84	.65	.50
Averages	.79	.91	1.03	1.24	1.49	1.15	.94	.79	.68

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
BLUE HILL, MASS.									
	Air mass								
	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86
Apr.									
4-----	----	----	----	----	----	1.30	1.12	1.00	0.87
7-----	----	----	----	1.27	----	----	----	----	----
9-----	----	----	----	1.34	----	1.30	1.10	.92	.87
12----	----	----	----	#1.15	----	----	----	----	----
20----	----	----	1.06	1.24	----	1.16	1.04	.92	----
22----	0.71	0.82	.94	1.13	----	1.24	----	----	----
24----	----	----	----	----	----	1.26	1.13	----	----
29----	----	----	----	1.27	----	----	----	----	----
30----	----	----	----	1.17	----	----	----	----	----
Averages	(.71)	(.82)	(1.00)	1.22	----	1.25	1.10	.95	(.87)
Departures	-.06	-.06	-.02	.04	----	.10	.16	.13	.17
BOSTON, MASS.									
	Air mass								
	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96
	NO DATA DURING APRIL 1954								
LINCOLN, NEBR.									
	Air mass								
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77
Apr.									
1-----	----	----	----	1.03	1.27	1.01	----	----	----
2-----	----	----	0.90	1.03	1.31	----	----	----	----
6-----	----	----	.90	1.05	1.29	1.03	0.84	0.67	0.56
16----	----	----	----	----	1.26	1.14	1.03	.92	.81
Averages	----	----	(.90)	1.04	1.28	1.06	(.94)	(.80)	(.69)
Departures	----	----	-.07	-.13	-.15	-.10	-.02	-.03	-.02

* Extrapolated
# Dust

Langley is the unit used to denote one gram calorie per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

SOLAR RADIATION DATA

APRIL 1954

Table 31a Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date-------------	2	3	4	5	6	7	8		9	10	11	12	13	14	15		16	17	18	19	20	21	22	
Langleys---------	110	93	91	101	72	83	84	91	09	110	90	109	99	91	107	99	27	33	97	111	99	109	102	83
Date-------------	23	24	25	26	27	28	29		30	1	2	3	4	5	6									
Langleys---------	53	109	125	134	38	59	108	90	125	130	79	33	46	52	55	74								

Table 31b Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date-------------	2	3	4	5	6	7	8		9	10	11	12	13	14	15		16	17	18	19	20	21	22	
Langleys---------	280	228	251	288	59	305	94	215	382	284	121	375	220	134	226	249	30	29	362	178	381	328	390	243
Date-------------	23	24	25	26	27	28	29		30	1	2	3	4	5	6									
Langleys---------	93	409	170	272	28	56	369	200	398	365	87	21	37	40	46	142								

Table 31c Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date-------------	2	3	4	5	6	7	8		9	10	11	12	13	14	15		16	17	18	19	20	21	22	
Langleys---------	327	417	419	184	57	399	116	274	416	364	117	335	324	104	315	282	12	14	338	294	348	332	332	239
Date-------------	23	24	25	26	27	28	29		30	1	2	3	4	5	6									
Langleys---------	35	343	182	247	26	52	316	171	307	292	69	15	30	36	38	113								

Table 31d Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date-------------	2	3	4	5	6	7	8		9	10	11	12	13	14	15		16	17	18	19	20	21	22	
Langleys---------	330	416	427	116	73	362	107	262	452	299	116	370	290	129	250	272	39	42	361	404	429	407	442	303
Date-------------	23	24	25	26	27	20	29		30	1	2	3	4	5	6									
Langleys---------	65	454	216	195	34	122	439	218	399	315	90	24	43	51	54	139								

Table 31e Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date-------------	2	3	4	5	6	7	8		9	10	11	12	13	14	15		16	17	18	19	20	21	22	
Langleys---------	179	99	95	174	112	80	136	125	61	157	178	163	141	185	197	155	26	24	---	268	76	97	57	91
Date-------------	23	24	25	26	27	28	29		30	1	2	3	4	5	6									
Langleys---------	69	112	256	270	51	107	67	133	166	221	132	24	45	67	78	104								

Note: Langley is the unit used to denote one gram calorie per square centimeter.

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.

1954	Aklavik, Mackenzie	Albuquerque, N.Mex.	Annette, Alaska	Apalachicola, Fla.	Astoria, Oreg.	Atlanta, Ga.	Barrow, Alaska	Bethel, Alaska	Bismark, N. Dak.	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Tex.	Canton Island, Pacific Area	Caribou, Me.	Charleston, S. C.	Columbia, Mo.	Columbus, Ohio
Apr. 2------	285	703	530	---	98	651	201	(469)	582	429	351	400	177	717	346	504	631	501
Apr. 3------	285	664	541	----	266	659	212	467	281	543	224	517	377	700	455	610	645	597
Apr. 4------	388	633	546	---	137	700	173	491	561	557	---	521	519	664	604	496	414	403
Apr. 5------	429	710	525	---	220	352	237	472	395	292	339	310	509	699	505	444	403	207
Apr. 6------	427	720	96	---	323	309	202	457	221	124	374	146	552	691	405	475	608	219
Apr. 7------	303	620	109	---	392	---	313	412	(519)	555	530	547	504	---	465	357	426	590
Apr. 8------	343	647	77	---	325	---	357	461	521	174	275	---	621	695	139	549	722	379
Averages------	351	671	346	---	251	534	242	(462)	(440)	382	349	407	466	694	417	491	550	414
Departures----	---	---	---	---	---	---	---	---	---	+6	---	+83	---	---	---	---	---	---
Apr. 9------	371	690	231	---	411	192	314	507	511	620	616	591	212	701	650	334	642	690
Apr. 10------	449	502	105	---	---	---	334	(520)	547	529	604	501	520	668	365	(264)	374	421
Apr. 11------	453	572	71	---	502	---	317	545	597	207	626	169	579	705	66	366	580	167
Apr. 12------	472	655	129	---	80	---	(294)	525	559	480	497	482	474	659	658	480	682	725
Apr. 13------	506	558	250	---	305	169	321	567	424	466	147	455	466	(688)	282	576	568	641
Apr. 14------	513	549	400	---	580	---	318	529	235	206	538	175	350	---	293	212	244	510
Apr. 15------	519	743	197	---	---	570	422	412	502	452	640	447	302	720	619	500	158	368
Averages------	469	610	198	---	376	311	(332)	(515)	(482)	423	524	403	415	(690)	419	(390)	464	503
Departures----	---	---	---	---	---	---	---	---	---	+51	---	+60	---	---	---	---	---	---
Apr. 16------	393	698	339	---	490	138	411	545	600	44	634	37	304	---	242	449	681	124
Apr. 17------	497	746	352	---	441	752	385	560	437	44	590	62	700	---	---	657	701	703
Apr. 18------	394	754	183	---	406	741	366	587	---	580	554	572	669	649	329	694	538	495
Apr. 19------	513	726	609	713	192	738	456	608	464	468	606	461	679	698	480	674	513	661
Apr. 20------	536	735	130	(517)	475	---	415	592	129	628	660	592	602	675	111	613	412	617
Apr. 21------	362	741	254	524	607	---	406	604	164	585	668	556	518	713	542	490	216	659
Apr. 22------	414	722	639	691	253	---	357	602	413	628	673	601	667	693	475	586	110	534
Averages------	444	732	358	(611)	409	592	399	585	368	425	626	411	591	686	363	595	453	542
Departures----	---	---	---	---	---	---	---	---	---	+23	---	+13	---	---	---	---	---	---
Apr. 23------	---	677	621	693	604	602	507	230	497	92	666	83	557	674	482	580	437	164
Apr. 24------	---	670	647	710	383	---	489	420	598	658	624	647	624	660	689	494	657	---
Apr. 25------	---	634	663	639	416	---	327	633	---	327	551	296	648	675	124	557	622	---
Apr. 26------	---	514	683	651	138	---	352	531	355	455	612	392	(553)	658	700	589	592	---
Apr. 27------	---	781	671	697	660	635	477	322	445	65	240	69	458	409	691	624	202	---
Apr. 28------	---	766	692	676	460	386	503	125	82	128	683	154	533	643	663	---	232	---
Apr. 29------	---	653	682	641	392	579	408	331	398	667	581	614	458	664	670	420	631	---
Averages------	---	671	666	672	436	551	438	371	396	342	565	322	(548)	626	574	544	482	---
Departures----	---	---	---	---	---	---	---	---	---	-94	---	-38	---	---	---	---	---	---
Apr. 30------	---	550	(444)	694	---	414	398	301	561	629	497	586	627	656	589	---	291	---
May 1------	---	370	(443)	690	669	429	525	531	568	583	672	545	558	676	611	587	376	---
May 2------	---	720	329	550	218	380	505	144	331	152	693	125	554	654	136	542	294	---
May 3------	---	818	77	429	342	247	348	295	620	43	450	44	651	655	624	657	564	---
May 4------	---	777	375	586	---	803	409	294	727	63	655	49	689	669	162	447	758	---
May 5------	---	792	239	754	---	773	400	593	614	86	705	109	709	695	95	(577)	789	---
May 6------	---	751	586	740	---	793	624	244	602	90	700	100	345	678	171	(564)	225	---
Averages------	---	683	(356)	635	---	548	458	343	575	235	624	223	590	669	341	(562)	471	---
Departures----	---	---	---	---	---	---	---	---	---	-225	---	-190	---	---	---	---	---	---

1954	Davis, Calif.	Dodge City, Kans.	E. Lansing, Mich.	E. Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Ely, Nev.	Fairbanks, Alaska	Fort Worth, Tex.	Fresno, Calif.	Grand Junction, Colo.	Great Falls, Mont.	Greensboro, N. C.	Griffin, Ga.	Hatteras, N. C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.	Lake Charles, La.
Apr. 2------	556	621	302	502	473	(681)	624	392	689	623	649	512	608	681	695	409	744	265	499
Apr. 3------	295	633	396	560	310	661	---	385	666	569	631	517	593	677	640	479	679	489	414
Apr. 4------	156	557	464	583	320	702	---	214	372	552	605	539	351	657	130	457	699	628	393
Apr. 5------	293	521	389	319	219	684	---	423	197	475	653	553	531	441	342	---	750	584	516
Apr. 6------	578	617	296	175	354	698	---	442	659	669	611	593	248	359	666	349	753	147	432
Apr. 7------	600	599	188	557	534	706	---	312	586	635	660	513	541	627	356	500	672	484	448
Apr. 8------	446	525	247	213	409	600	---	424	336	614	638	(402)	417	591	657	520	748	198	141
Averages------	418	582	326	415	374	(676)	---	370	501	591	635	(519)	470	576	498	452	721	399	406
Departures----	-64	---	+38	+58	---	---	---	+26	---	+77	---	---	---	---	---	---	---	+105	---
Apr. 9------	649	558	443	596	166	636	(699)	280	337	673	614	634	666	195	252	677	756	617	298
Apr. 10------	647	484	77	584	546	559	---	358	629	448	679	632	223	315	606	259	611	364	498
Apr. 11------	630	168	482	328	462	518	653	477	541	645	515	(591)	273	507	436	344	743	58	514
Apr. 12------	599	557	515	417	425	(243)	---	415	102	647	323	245	666	702	503	643	748	170	468
Apr. 13------	550	528	448	550	500	304	---	420	457	610	693	217	529	217	637	635	717	564	600
Apr. 14------	651	304	386	259	333	569	---	428	337	628	424	535	346	376	618	390	744	77	470
Apr. 15------	636	(644)	154	252	554	680	712	492	661	639	733	648	434	532	660	279	---	236	88
Averages------	623	(463)	358	427	427	(501)	---	410	438	613	569	(500)	448	406	530	461	720	298	419
Departures----	+74	---	+42	+38	---	---	---	+40	---	+57	---	---	---	---	---	---	---	-13	---
Apr. 16------	609	701	78	107	110	656	713	510	795	643	732	297	220	205	536	101	---	32	652
Apr. 17------	623	690	518	105	550	676	711	493	749	661	723	(238)	478	794	256	651	---	427	710
Apr. 18------	603	687	215	571	414	708	---	432	(785)	671	718	386	692	751	746	308	---	476	679
Apr. 19------	627	472	210	559	353	705	707	526	746	674	702	343	698	---	740	575	---	389	529
Apr. 20------	641	578	122	620	508	708	---	538	709	680	690	306	685	---	731	554	---	470	570
Apr. 21------	649	222	450	580	495	493	712	355	533	667	662	509	642	485	730	552	---	600	633
Apr. 22------	636	263	144	627	185	691	734	548	---	659	741	319	566	461	736	499	---	531	518
Averages------	627	516	248	453	374	663	715	486	(719)	665	710	(343)	569	539	639	463	---	418	613
Departures----	+55	---	-119	+39	---	---	---	+92	---	+69	---	---	---	---	---	---	---	+77	---
Apr. 23------	581	567	415	378	317	658	---	488	642	632	676	339	591	532	673	203	---	165	572
Apr. 24------	310	667	202	---	314	590	531	561	717	224	644	434	681	561	(720)	501	718	610	628
Apr. 25------	565	512	156	---	315	711	628	---	737	420	200	554	551	475	502	586	---	160	577
Apr. 26------	547	672	349	---	350	500	422	388	450	648	723	668	617	516	733	570	---	205	666
Apr. 27------	99	502	122	115	(475)	740	316	578	391	104	665	171	578	547	754	467	---	175	373
Apr. 28------	528	643	203	159	311	751	---	588	625	647	565	482	582	447	595	143	---	54	618
Apr. 29------	548	251	126	649	(404)	610	---	355	397	611	306	333	283	443	187	290	---	585	591
Averages------	454	545	225	325	(355)	651	474	493	566	469	540	426	555	503	(595)	394	---	279	575
Departures----	-91	---	-123	-84	---	---	---	+92	---	-114	---	---	---	---	---	---	---	-108	---
Apr. 30------	713	377	305	639	621	640	237	374	555	724	291	445	341	390	589	375	823	621	242
May 1------	709	79	452	602	540	571	---	481	256	724	332	459	465	376	644	351	827	398	261
May 2------	668	292	212	213	668	761	791	573	703	706	778	780	644	380	681	244	827	489	187
May 3------	399	659	179	119	500	757	---	570	849	649	758	463	448	310	737	412	808	154	(725)
May 4------	679	660	327	148	577	758	592	553	824	685	585	722	667	785	202	508	813	252	756
May 5------	693	708	251	215	585	775	535	387	775	686	743	605	676	749	616	707	806	426	731
May 6------	645	718	485	226	637	763	747	527	771	656	756	224	752	768	730	360	769	271	694
Averages------	644	499	316	309	590	718	581	495	676	690	606	528	570	537	600	423	811	373	514
Departures----	+38	---	-67	-125	---	---	---	---	---	+52	---	---	---	---	---	---	---	-59	---

Accumulated Departures January 1 to May 6, 1954

Aklavik, Mackenzie	Albuquerque, N.Mex.	Annette, Alaska	Apalachicola, Fla.	Astoria, Oreg.	Atlanta, Ga.	Barrow, Alaska	Bethel, Alaska	Bismark, N. Dak.	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Tex.	Canton Island, Pacific Area	Caribou, Me.	Charleston, S. C.	Columbia, Mo.	Columbus, Ohio
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Davis, Calif.	Dodge City, Kans.	E. Lansing, Mich.	E. Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Ely, Nev.	Fairbanks, Alaska	Fort Worth, Tex.	Fresno, Calif.	Grand Junction, Colo.	Great Falls, Mont.	Greensboro, N. C.	Griffin, Ga.	Hatteras, N. C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.	Lake Charles, La.
---	---	-903	+392	---	---	---	---	---	+3325	---	---	---	---	---	---	---	-1218	---

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

SOLAR RADIATION DATA

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.-Continued

1954	Lander, Wyo.	Las Vegas, Nev.	Lincoln, Neb.	Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBCO)	Madison, Wisc.	Medford, Ore.	Miami, Fla.	Midland, Tex.	Nashville, Tenn.	Newport, R. I.	New York, N. Y.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Ottawa, Ontario	Phoenix, Ariz.	Prosser 4 NE, Wash.	Rapid City, S. Dak.	Riverside, Calif.	San Antonio, Tex.	Santa Maria, Calif.	S. Ste. Marie, Mich.	Sayville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle, Wash. (U. of W.)	Seattle, Wash. (WBAS)	State College, Pa.	Stillwater, Okla.	Swan Island, W. I.	Tampa, Fla.	Toronto, Ontario	Upton, N. Y.	Wake Island, Pacific Area	Washington, D. C. (Silver Hill Obs.)	Winnipeg, Manitoba
Apr. 2------	569	681	572	630	642	609	204	237	485	691	650	563	473	598	588	---	701	197	197	653	---	422	432	559	289	497	159	151	403	638	672	520	179	539	662	571	596
Apr. 3------	524	660	456	602	585	603	389	311	381	511	619	628	661	533	544	(626)	676	302	462	650	222	639	540	655	532	580	283	374	648	564	627	468	421	611	637	588	500
Apr. 4------	469	596	556	435	591	538	250	216	566	637	506	652	651	496	488	690	681	198	523	610	495	585	(512)	653	539	601	240	189	631	554	---	486	574	628	656	509	535
Apr. 5------	572	683	398	363	619	594	498	392	215	674	374	170	38	577	352	556	676	302	491	570	497	624	(567)	74	515	220	143	209	514	417	700	657	523	65	661	145	507
Apr. 6------	461	679	570	296	606	336	402	461	488	718	271	136	146	126	594	37	699	481	237	547	469	680	(297)	161	72	332	459	539	296	634	680	587	67	166	497	390	208
Apr. 7------	640	601	571	395	635	555	177	500	523	609	493	580	514	316	490	(251)	692	586	558	650	526	678	(43)	594	500	559	346	388	460	588	626	501	232	595	522	504	461
Apr. 8------	593	691	518	538	667	605	624	428	163	166	413	262	249	107	619	(481)	688	239	484	639	287	670	(603)	272	170	465	279	332	396	667	594	669	506	288	675	349	563
Averages------	547	656	520	466	621	549	363	364	403	572	475	427	390	393	525	(440)	687	329	422	617	416	614	(428)	424	374	465	273	312	478	580	650	555	357	413	616	436	481
Departures----	---	---	+127	---	---	---	-7	---	---	---	+60	+37	+43	---	---	---	---	---	---	+155	---	---	---	---	---	---	---	---	+120	---	---	---	---	---	---	---	---
Apr. 9------	639	697	394	544	---	619	474	660	599	627	674	659	654	619	391	662	697	534	265	635	294	687	(440)	689	542	663	260	380	664	493	658	589	544	679	662	659	480
Apr. 10------	649	674	357	199	471	475	410	564	574	627	322	637	648	611	387	286	649	626	539	620	375	599	(357)	688	545	668	533	630	580	524	641	508	64	(663)	662	559	249
Apr. 11------	651	663	417	355	350	(193)	611	561	645	446	148	404	430	84	68	(246)	710	620	625	427	508	541	357	433	76	550	509	583	137	171	629	525	376	(431)	602	507	569
Apr. 12------	634	700	602	337	437	(613)	621	364	611	92	702	480	575	643	100	700	691	317	604	642	542	668	466	547	445	586	144	155	458	156	611	667	384	(608)	536	635	534
Apr. 13------	476	695	524	405	435	521	431	---	448	195	447	591	616	267	201	(537)	673	552	590	663	565	658	346	633	438	643	323	569	626	412	464	555	389	609	579	651	506
Apr. 14------	341	702	472	536	181	162	540	593	619	616	381	256	360	242	---	88	699	653	235	388	248	666	(605)	383	116	585	384	(471)	374	251	488	552	226	364	665	607	365
Apr. 15------	603	691	220	181	421	497	98	672	601	361	---	399	428	501	405	(482)	705	587	462	606	552	695	(67)	528	434	275	291	315	140	431	662	553	127	531	660	261	501
Averages------	571	689	426	365	383	(440)	455	569	585	424	446	490	530	424	259	(429)	689	556	474	569	441	645	(377)	557	371	567	349	(443)	426	348	593	564	301	(555)	624	554	458
Departures----	---	---	+19	---	---	---	+56	---	---	---	+52	+83	+172	---	---	---	---	---	---	+77	---	---	---	---	---	---	---	---	+50	---	---	---	---	---	---	---	---
Apr. 16------	651	723	629	617	420	638	606	670	604	750	101	65	27	63	679	54	717	634	637	669	744	585	164	28	54	127	224	549	55	741	658	614	78	16	658	96	649
Apr. 17------	619	731	620	687	555	651	520	628	490	770	728	57	55	641	640	428	727	505	545	673	762	652	401	51	77	66	---	379	411	671	373	591	438	(48)	663	232	440
Apr. 18------	514	720	496	686	231	447	322	681	429	729	701	611	584	657	648	542	735	587	133	680	766	519	(529)	615	352	603	---	280	396	662	559	530	433	(589)	601	592	510
Apr. 19------	651	740	440	656	337	377	476	(631)	531	715	725	558	581	665	592	278	716	630	76	577	672	441	458	655	325	639	---	370	605	579	682	579	234	(606)	617	633	556
Apr. 20------	681	726	324	622	254	239	293	(695)	549	780	724	670	649	(656)	602	107	740	684	245	529	596	(520)	---	713	492	666	---	527	622	610	552	569	323	(686)	661	664	---
Apr. 21------	626	---	525	585	286	338	206	(686)	281	566	591	619	647	611	330	432	729	674	643	455	596	349	---	674	502	654	---	602	638	279	600	485	479	629	617	663	---
Apr. 22------	694	670	467	617	---	295	613	---	(329)	545	509	674	649	542	131	495	727	681	514	421	482	230	---	689	491	638	---	245	543	111	160	446	376	677	613	580	669
Averages------	634	718	500	640	352	426	434	(665)	(459)	694	583	465	456	(548)	517	334	727	628	399	572	660	(471)	(388)	489	328	485	---	422	467	522	512	545	337	(464)	633	494	565
Departures----	---	---	+51	---	---	---	+20	---	---	---	+102	+36	+65	---	---	---	---	---	---	+63	---	---	---	---	---	---	---	---	+62	---	---	---	---	---	---	---	---
Apr. 23------	683	684	214	641	234	138	613	714	159	574	470	446	229	293	603	598	757	701	549	429	679	117	(663)	461	89	444	372	665	137	617	539	336	540	472	556	457	66
Apr. 24------	560	416	595	627	445	226	163	690	673	732	706	687	434	600	575	639	492	678	615	517	667	322	(152)	530	550	251	---	617	331	669	703	498	537	564	622	115	398
Apr. 25------	638	706	519	393	634	318	59	717	484	---	668	286	421	525	559	508	746	591	333	465	425	465	(662)	344	192	337	---	429	391	625	637	574	406	368	683	431	185
Apr. 26------	596	702	294	647	615	534	510	358	454	---	697	641	377	---	463	334	503	291	416	693	332	542	---	547	265	415	---	210	553	505	616	540	122	598	673	508	144
Apr. 27------	540	604	372	592	227	186	147	---	429	---	464	96	111	417	465	90	739	509	645	286	199	118	96	146	33	401	---	595	304	635	609	614	54	129	662	342	228
Apr. 28------	408	659	222	125	614	455	170	---	439	802	280	87	58	499	548	(664)	755	736	337	550	333	635	(694)	79	101	120	---	614	81	547	703	645	268	61	580	260	53
Apr. 29------	476	612	71	340	539	237	193	639	506	411	290	716	670	538	485	(684)	746	617	259	304	357	548	(666)	747	607	625	---	377	194	516	469	664	633	720	490	287	374
Averages------	544	626	327	481	472	304	265	624	449	630	511	423	329	479	528	(502)	677	589	450	463	428	392	(489)	408	263	371	---	501	284	588	611	553	366	416	610	343	207
Departures----	---	---	-94	---	---	---	-163	---	---	---	+62	-16	-102	---	---	---	---	---	---	+3	---	---	---	---	---	---	---	---	-111	---	---	---	---	---	---	---	---
Apr. 30------	143	643	67	265	550	419	328	523	617	671	419	703	641	521	---	590	559	657	246	298	742	743	(376)	756	569	658	---	719	419	159	699	601	416	732	544	566	458
May 1------	627	755	174	147	649	630	327	641	564	765	602	617	481	415	---	301	706	730	231	731	531	(757)	(408)	572	298	521	---	709	---	165	---	451	411	562	647	553	650
May 2------	754	746	122	77	708	716	81	460	654	777	482	113	190	562	---	678	741	506	490	767	417	(757)	579	118	423	530	---	322	---	501	700	671	574	106	629	599	269
May 3------	766	727	546	678	683	712	375	708	659	801	155	76	63	69	737	186	777	613	606	745	---	738	(289)	59	94	444	---	375	---	788	---	650	93	55	591	529	539
May 4------	742	738	229	736	708	723	397	693	583	787	711	131	259	602	670	(431)	771	462	562	760	---	693	402	343	187	307	---	423	---	723	688	560	314	366	646	525	745
May 5------	692	740	630	736	628	649	307	701	495	755	678	317	675	678	693	(572)	783	744	581	734	787	700	655	740	583	544	---	598	---	739	644	698	262	710	542	746	743
May 6------	120	713	465	601	555	568	647	743	665	887	529	560	453	572	441	456	(755)	724	448	611	726	552	502	505	485	427	---	692	---	583	353	646	403	587	567	611	472
Averages------	549	723	319	463	640	631	352	638	605	778	511	359	395	489	635	(459)	(728)	634	452	664	640	(706)	(459)	442	377	490	---	548	---	522	617	611	353	445	595	590	554
Departures----	---	---	-119	---	---	---	-89	---	---	---	+43	-107	-25	---	---	---	---	---	---	+92	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Accumulated Departures January 1 to May 6, 1954

	Lander, Wyo.	Las Vegas, Nev.	Lincoln, Neb.	Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBCO)	Madison, Wisc.	Medford, Ore.	Miami, Fla.	Midland, Tex.	Nashville, Tenn.	Newport, R. I.	New York, N. Y.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Ottawa, Ontario	Phoenix, Ariz.	Prosser 4 NE, Wash.	Rapid City, S. Dak.	Riverside, Calif.	San Antonio, Tex.	Santa Maria, Calif.	S. Ste. Marie, Mich.	Sayville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle, Wash. (U. of W.)	Seattle, Wash. (WBAS)	State College, Pa.	Stillwater, Okla.	Swan Island, W. I.	Tampa, Fla.	Toronto, Ontario	Upton, N. Y.	Wake Island, Pacific Area	Washington, D. C. (Silver Hill Obs.)	Winnipeg, Manitoba
	---	---	-123	---	---	---	-1555	---	---	---	+7021	---	---	---	---	---	---	---	---	+5712	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Note.--Langley ie the unit used to denote one gram calorie per equare centimeter.
Valuee in parenthesee are interpolated.

ILLUMINATION DATA

Table 34.-Daily illumination on a horizontal surface, tabulated in hundreds of foot-candle hours. APRIL 1954

Station	Day of month																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average
Baltimore, Md.----------------	528	608	608	516	220	486	634	414	670	706	546	654	676	660	234	98	230	621	716	754	747	634	402	116	495	586	212	130	386	620		497
Washington, D.C. (WBCO)-------	550	593	---	---	(179)	514	656	437	710	629	505	718	723	682	307	106	332	673	797	766	770	782	414	144	479	524	404	303	343	670		525

The foot-candle hour is the average illumination for one hour, in foot-candles. Foot-candle hours for a day are obtained by summing the foot-candle hours for the individual hours of that day. The illumination values are compiled from continuous records of the illumination output of a Foster Illuminometer. For a description of this instrument see "A Recording Daylight Illuminometer", by Norman B. Foster, in Illuminating Engineering, Vol. XLVI No. 2, pages 59 to 62.

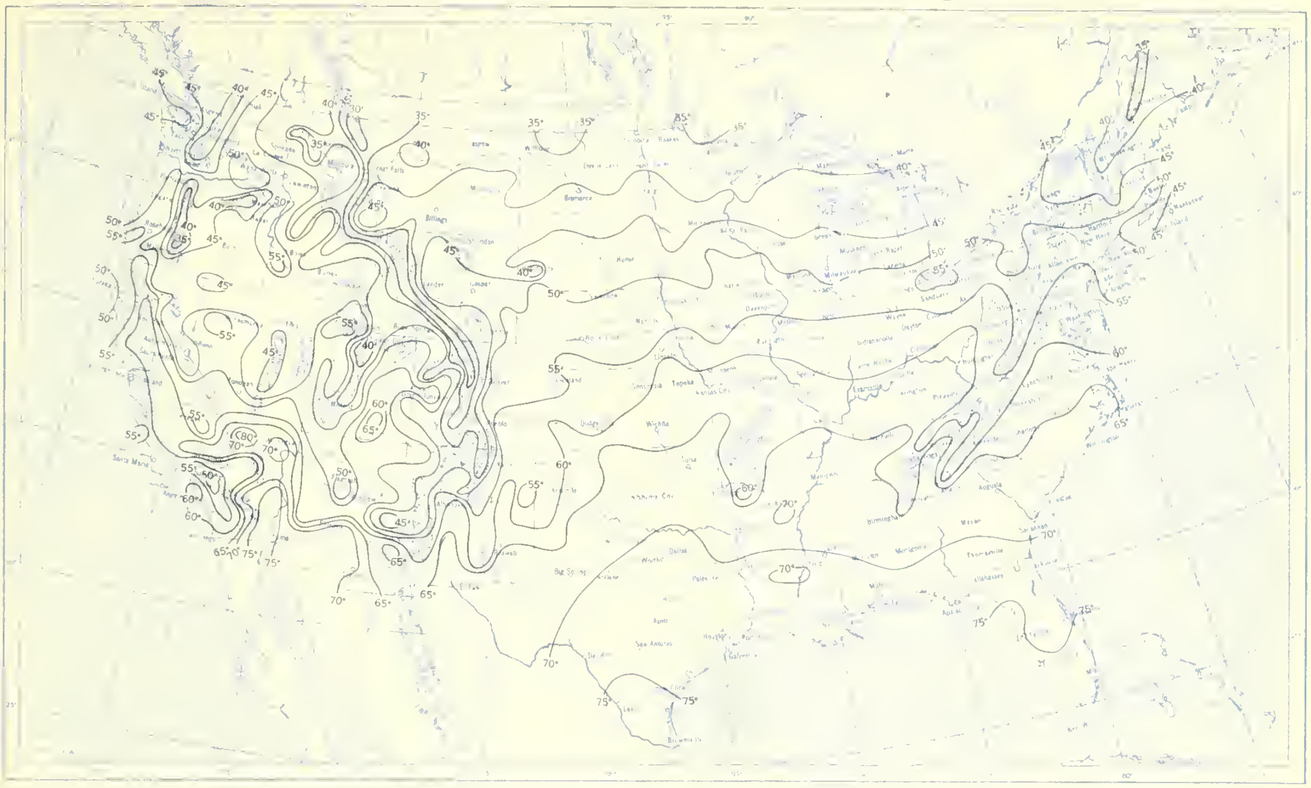
CORRECTION

1953 ANNUAL, Vol. 4, No. 13.

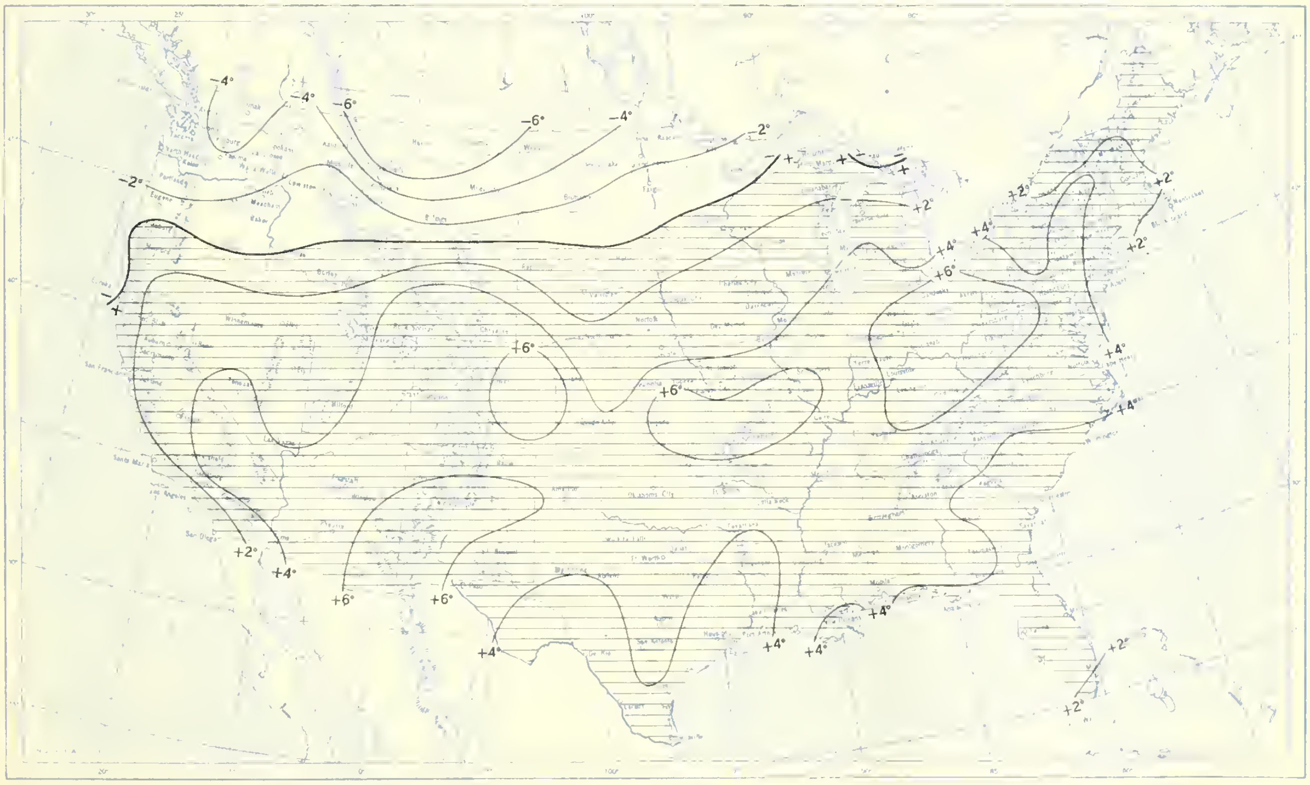
Page 73, lines 6 and 7 of the second paragraph describing hurricane FLORENCE should read:
"- Red Cross estimate showed that 273 homes were damaged".

NWRC, Asheville, N.C. ---7/12/54 --- 1800

Chart I. A. Average Temperature (°F.) at Surface, April 1954.

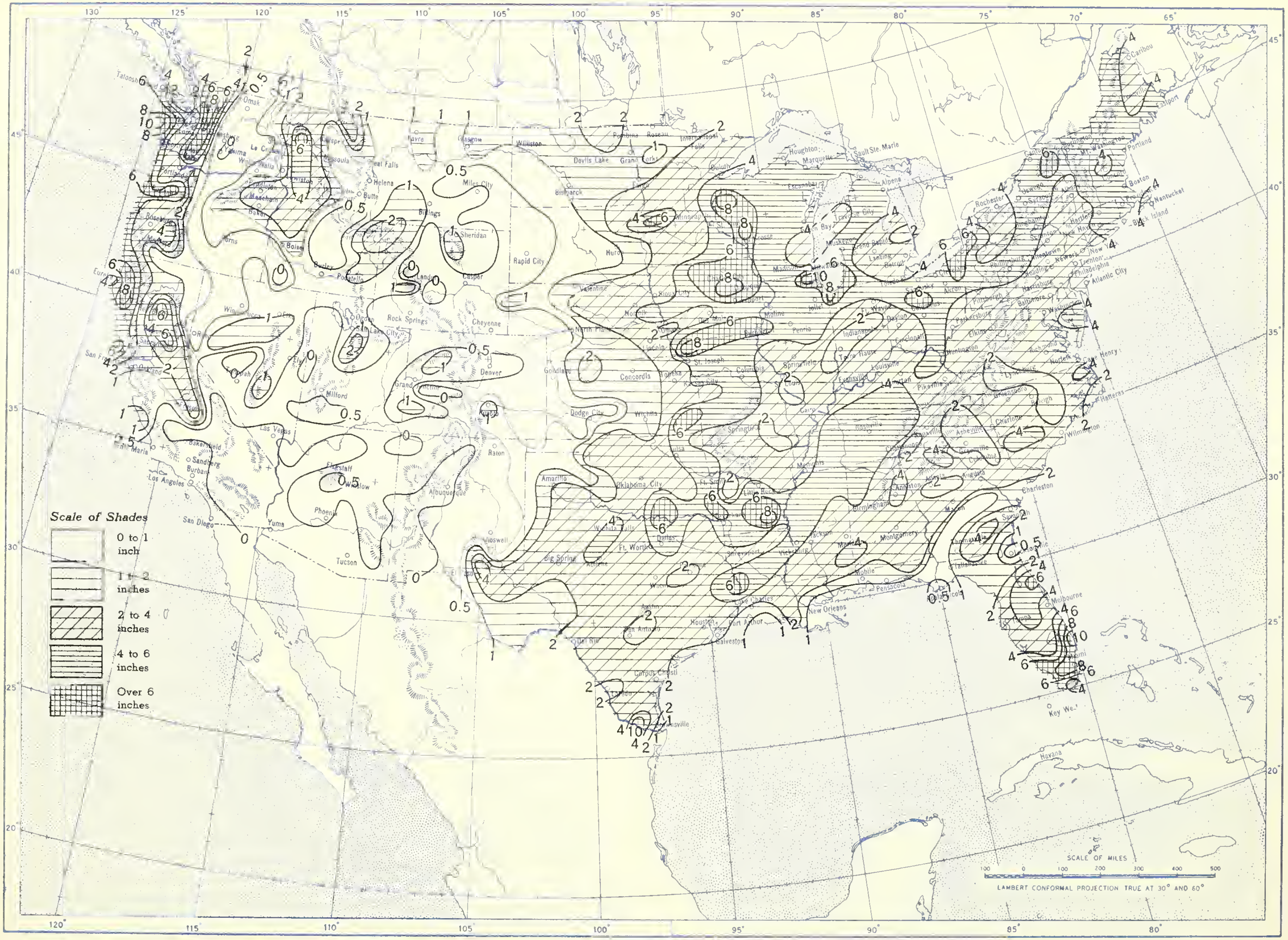


B. Departure of Average Temperature from Normal (°F.), April 1954.



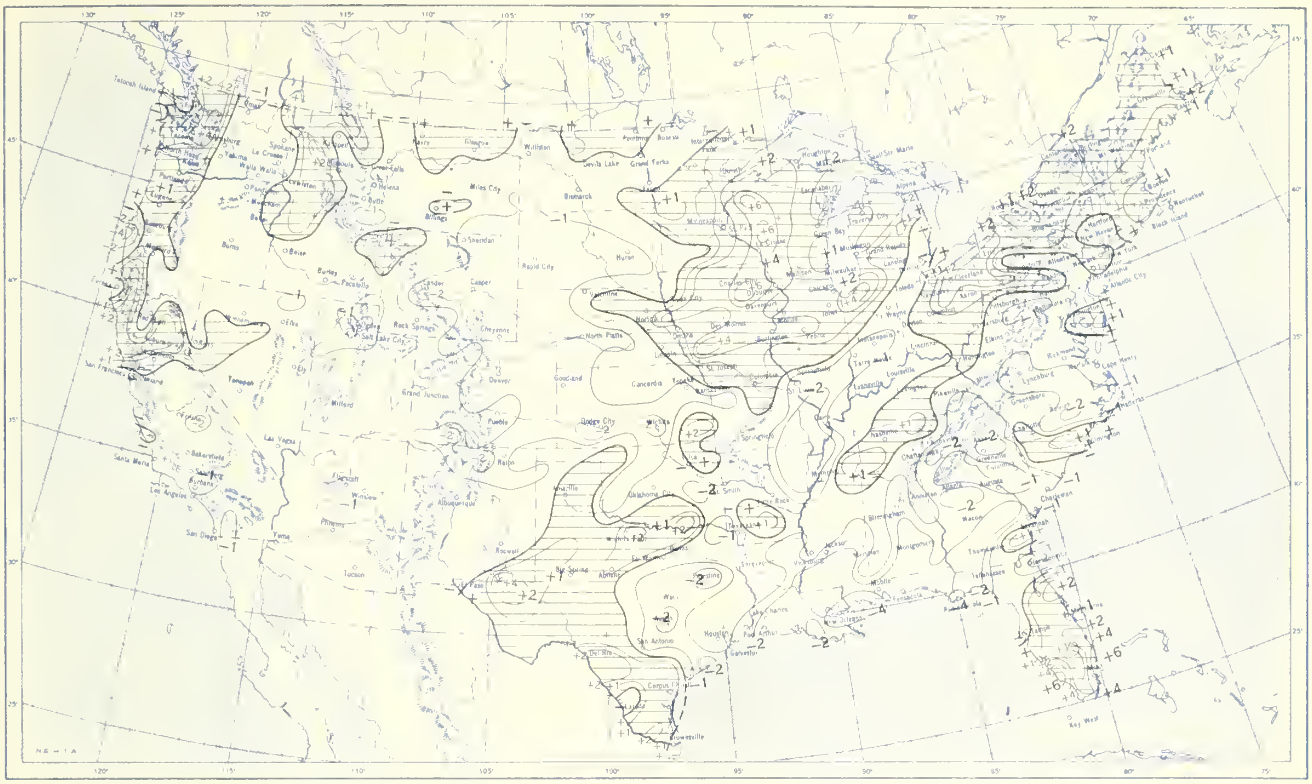
A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively. B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), April 1954.

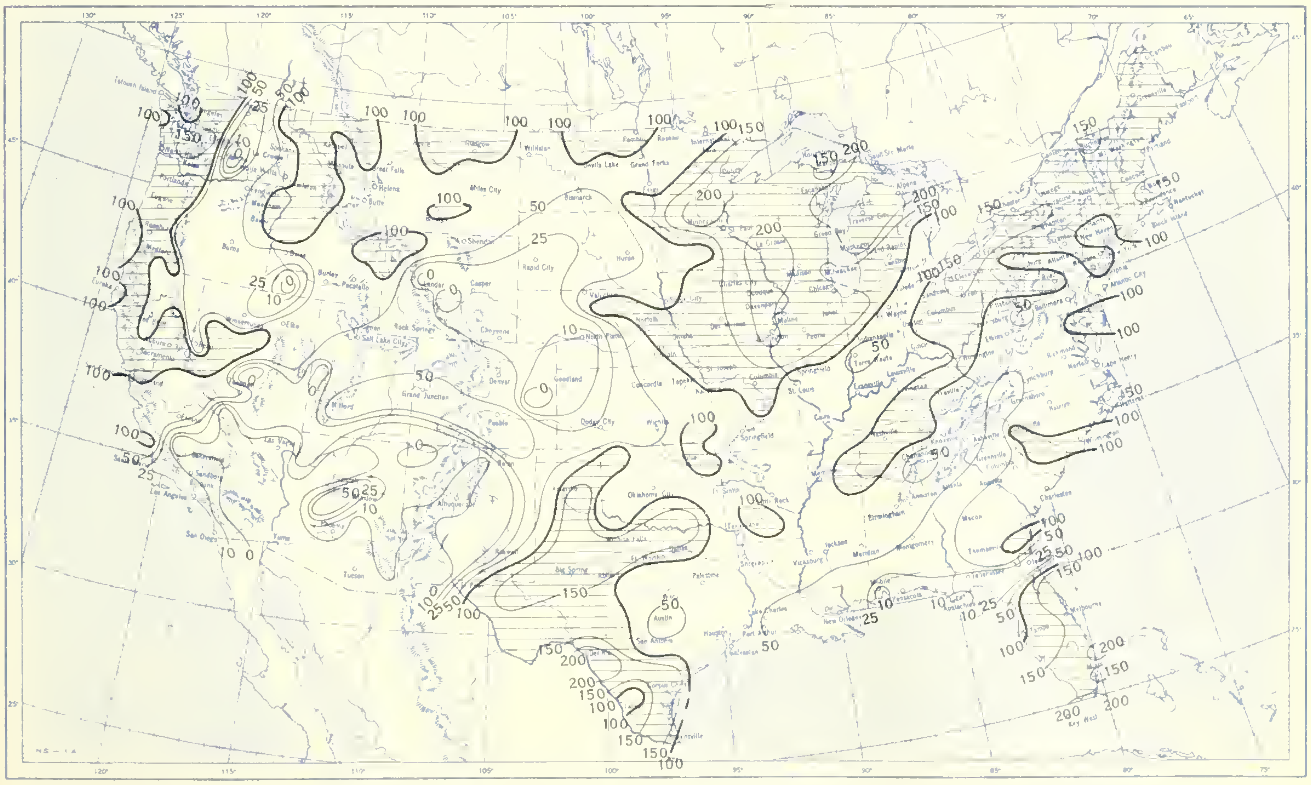


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), April 1954.

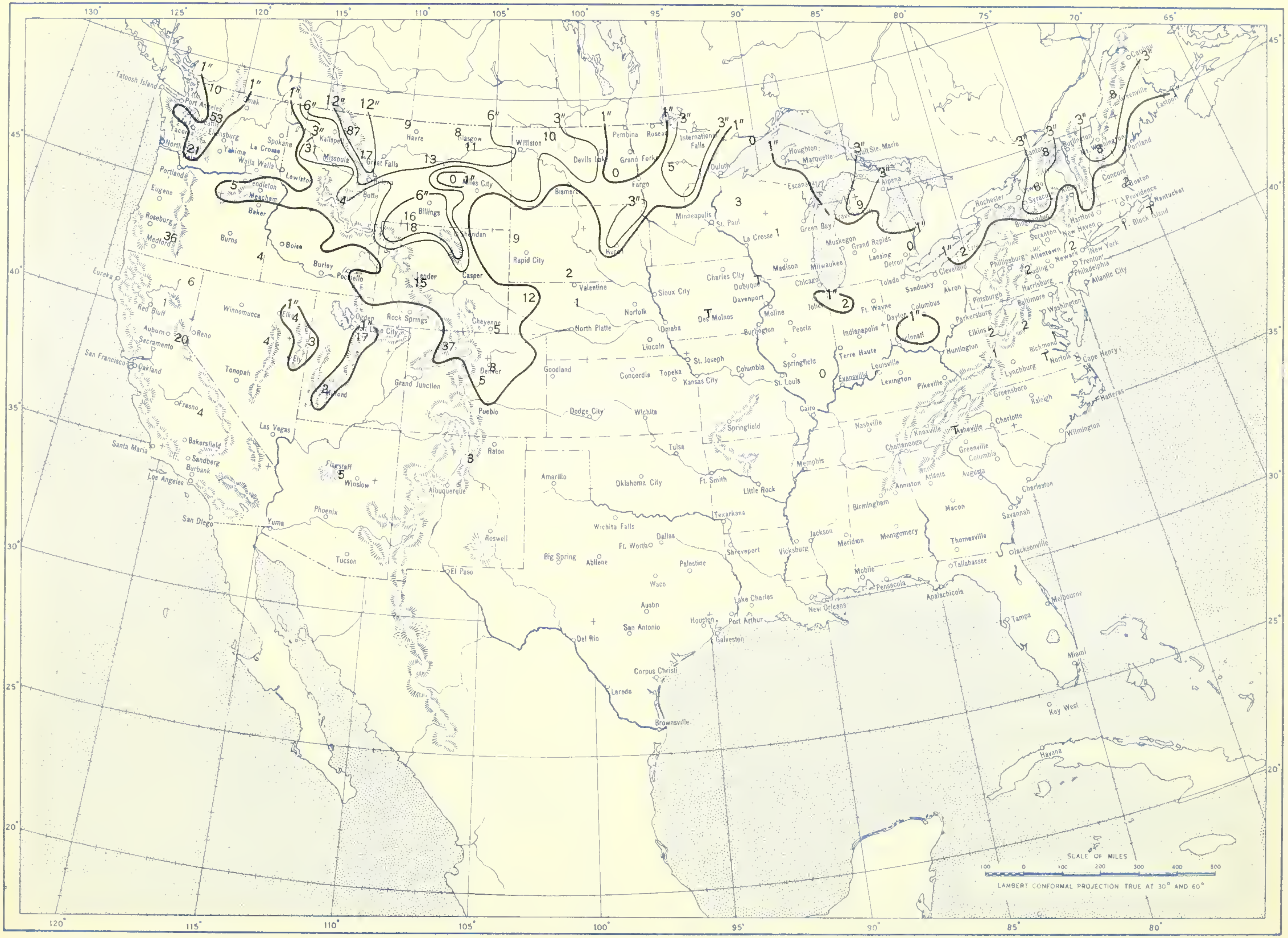


B. Percentage of Normal Precipitation, April 1954.



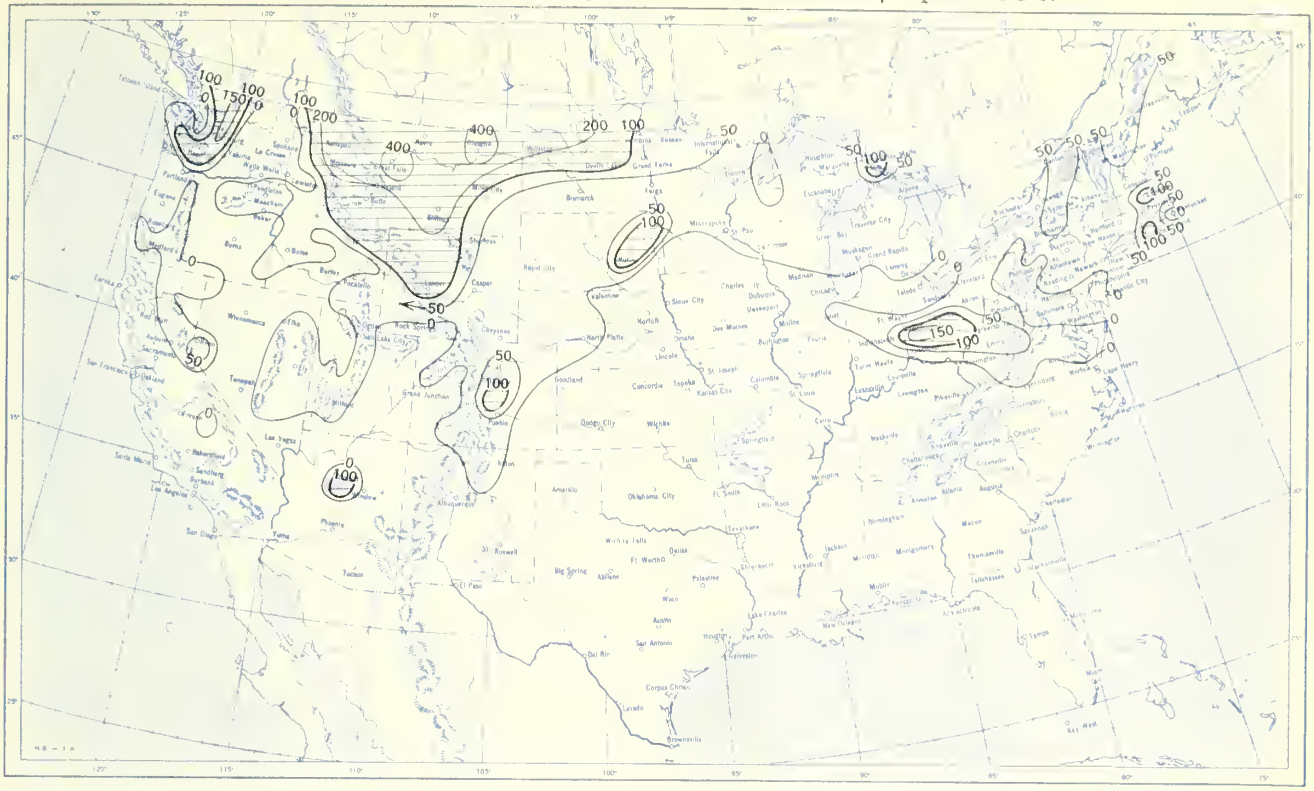
Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart IV. Total Snowfall (Inches), April 1954.



This is the total of unmelted snowfall recorded during the month at Weather Bureau and cooperative stations. This chart and Chart V are published only for the months of November through April although of course there is some snow at higher elevations, particularly in the far West, earlier and later in the year.

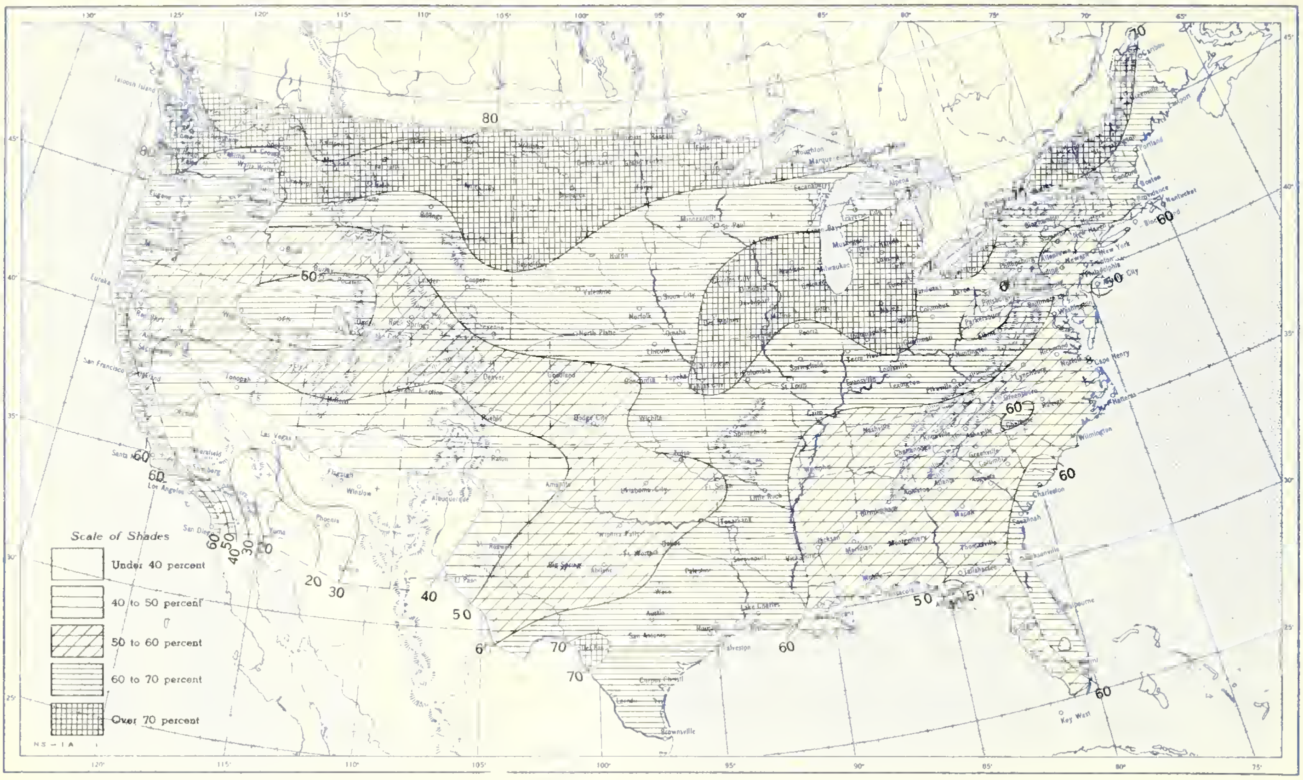
Chart V. A. Percentage of Normal Snowfall, April 1954.



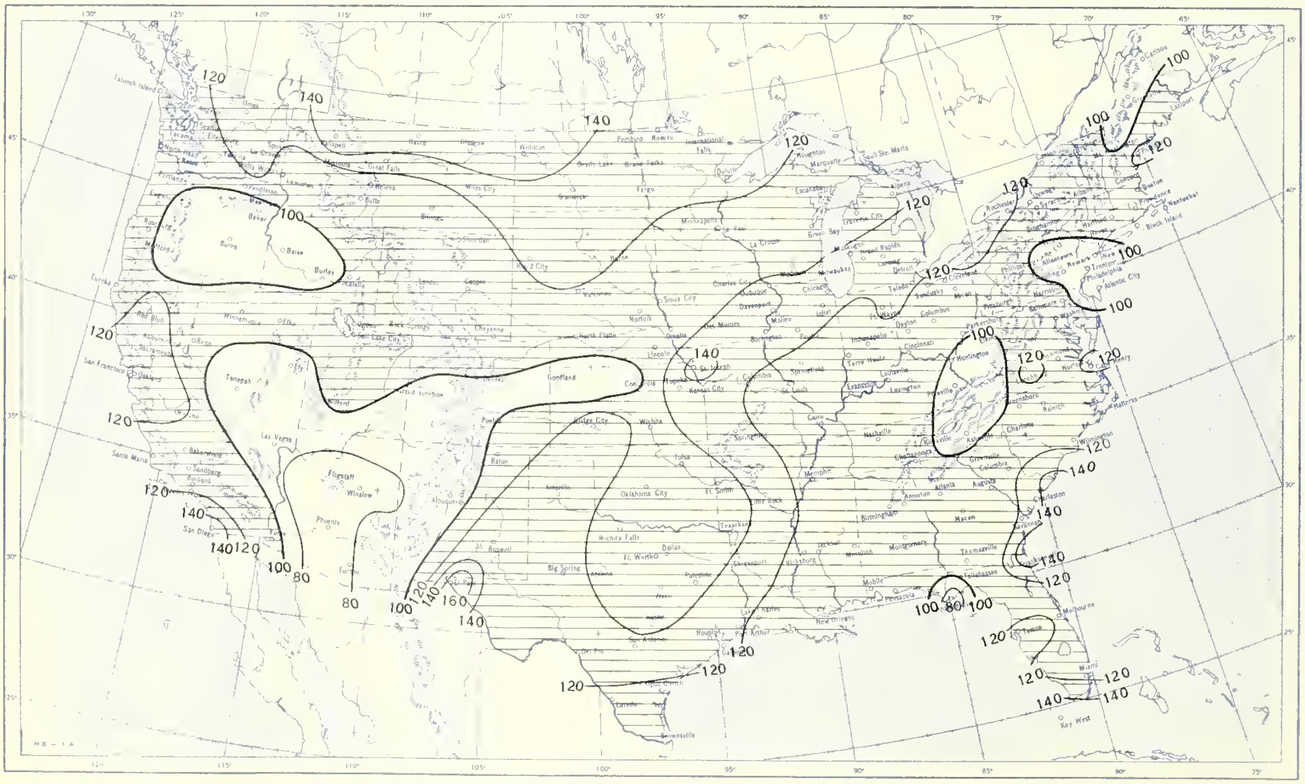
B. Depth of Snow on Ground (Inches).

A. Amount of normal monthly snowfall is computed for Weather Bureau stations having at least 10 years of record.
B. Shows depth currently on ground at 7:30 a. m. E.S.T., of the Tuesday nearest the end of the month. It is based on reports from Weather Bureau and cooperative stations. Dashed line shows greatest southern extent of snowcover during month.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, April 1954.

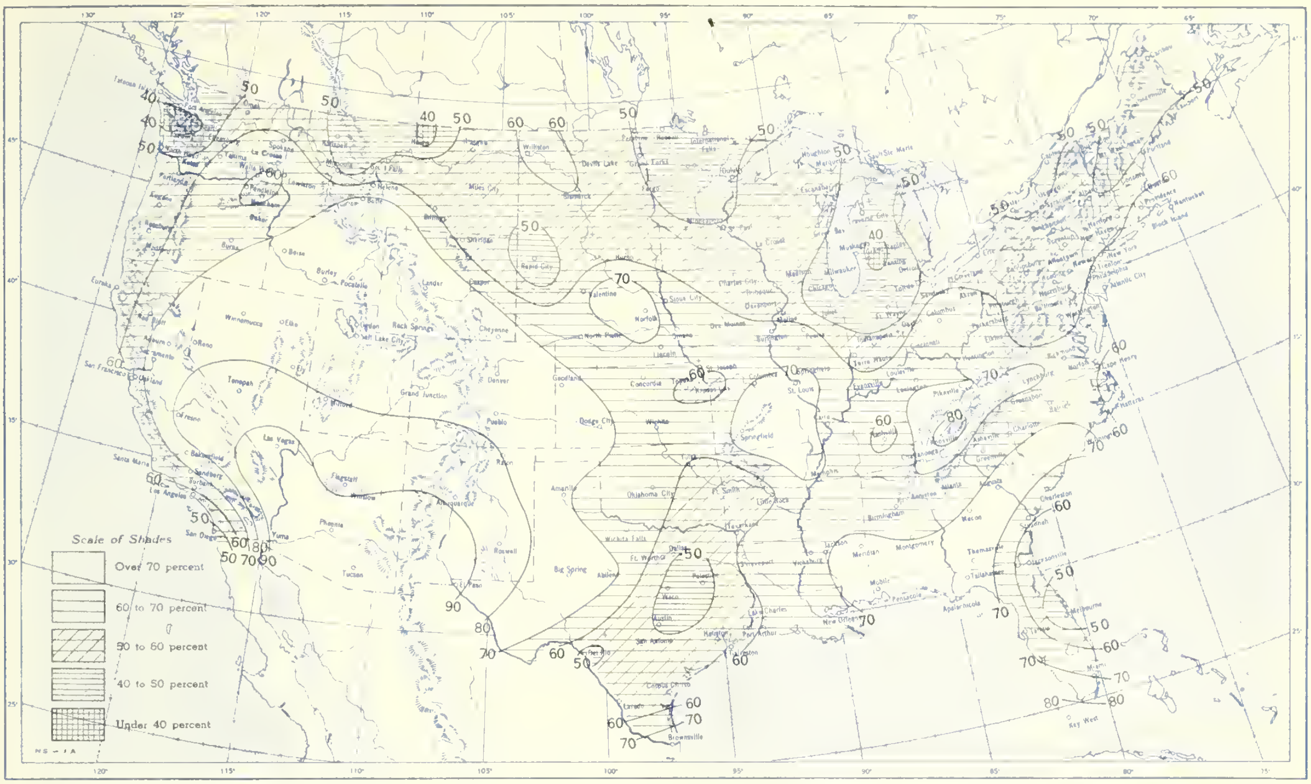


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, April 1954.

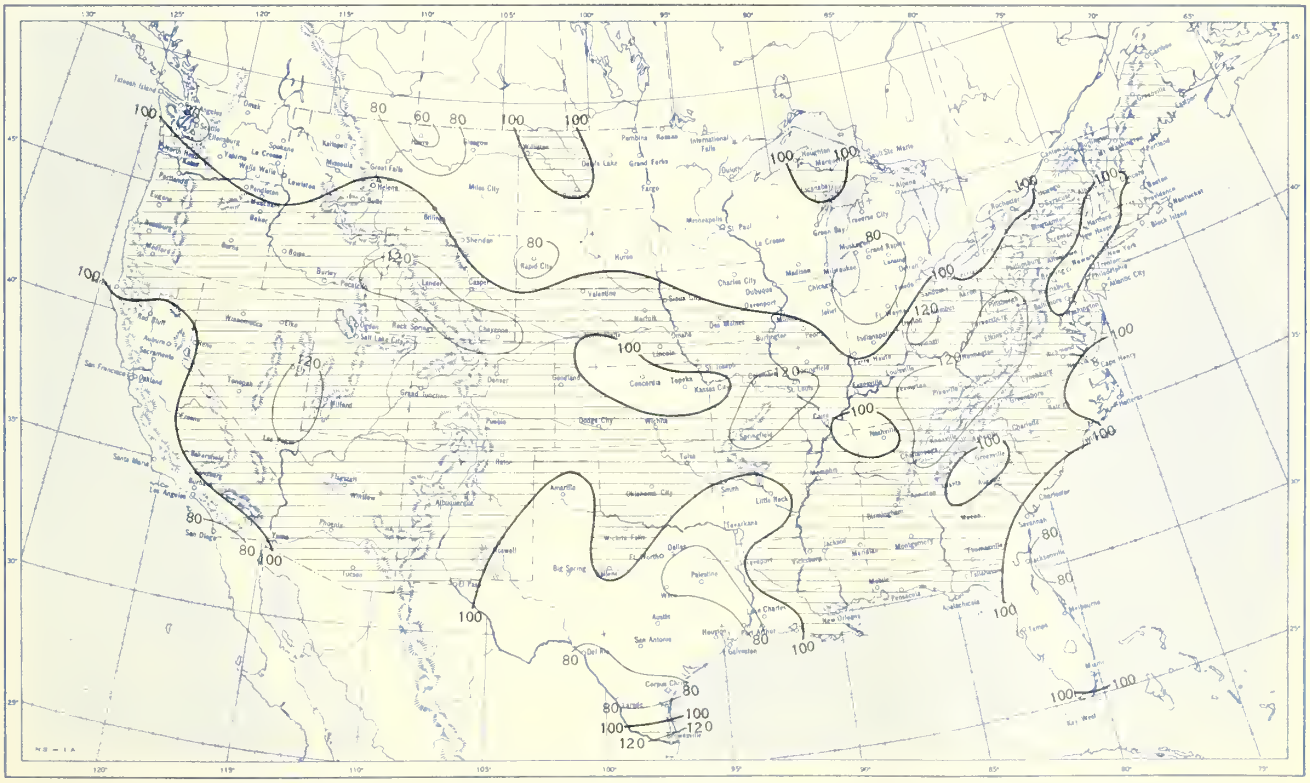


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, April 1954.



B. Percentage of Normal Sunshine, April 1954.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, April 1954. Inset: Percentage of Normal Average Daily Solar Radiation, April 1954.

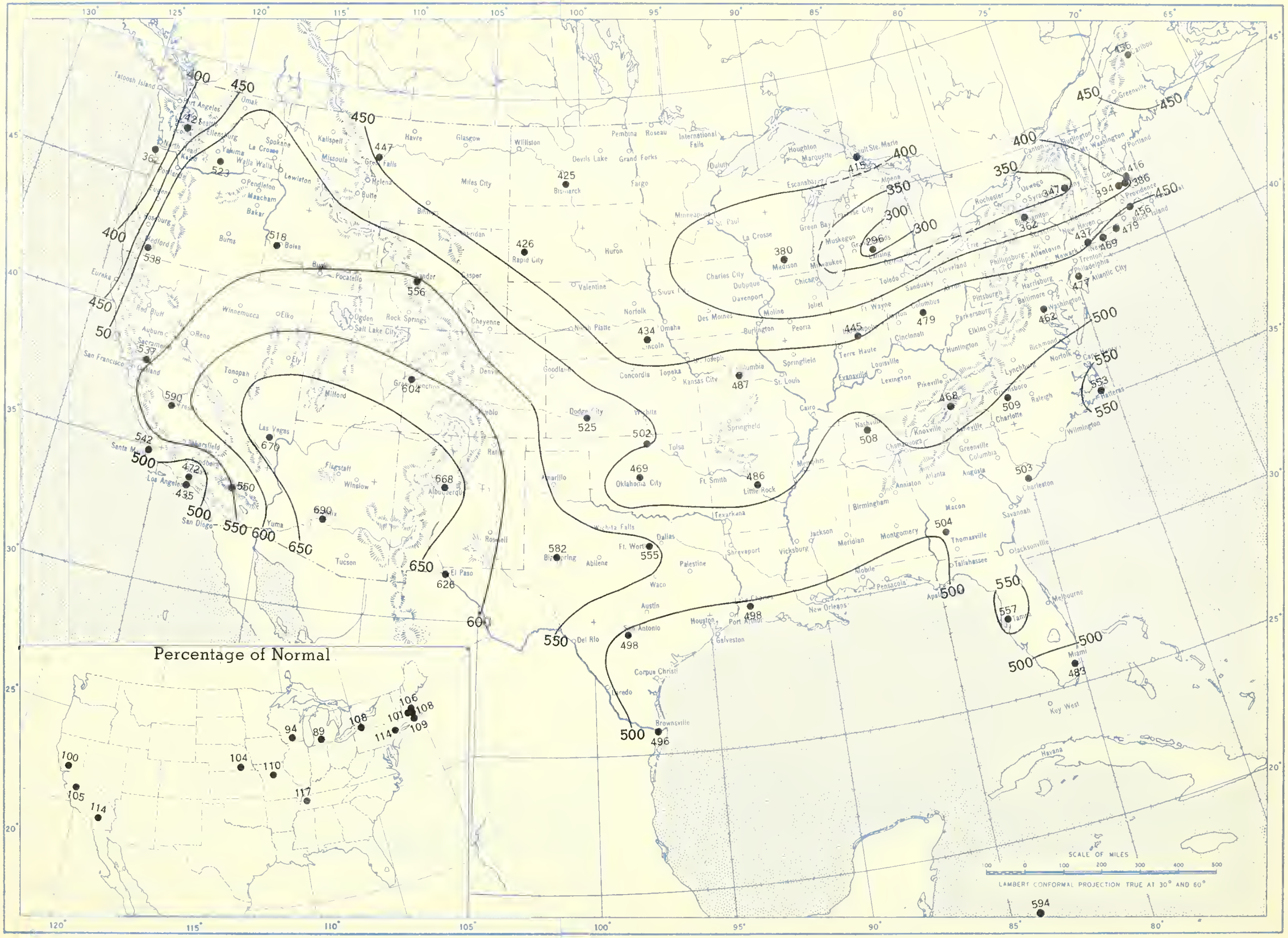
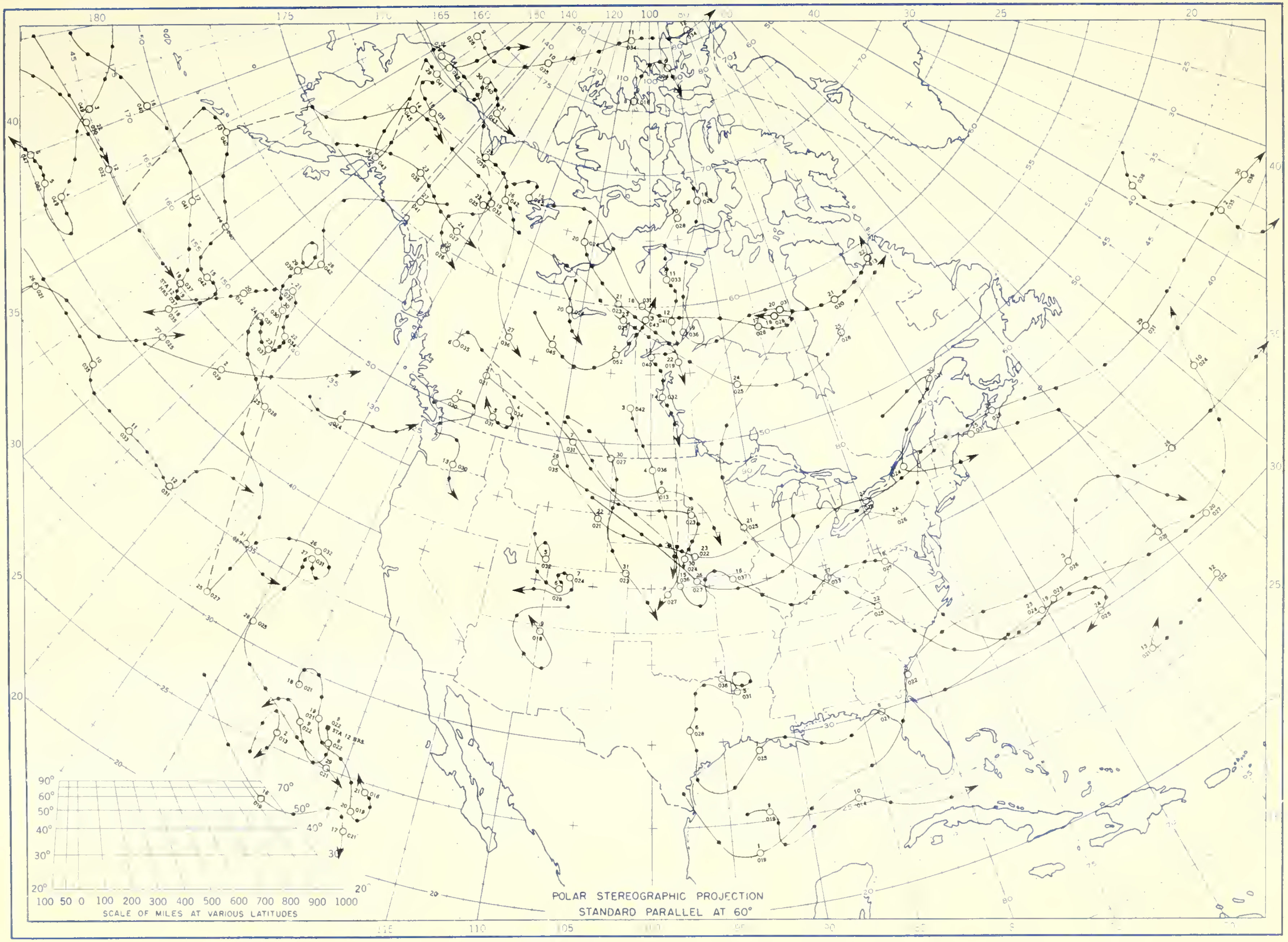


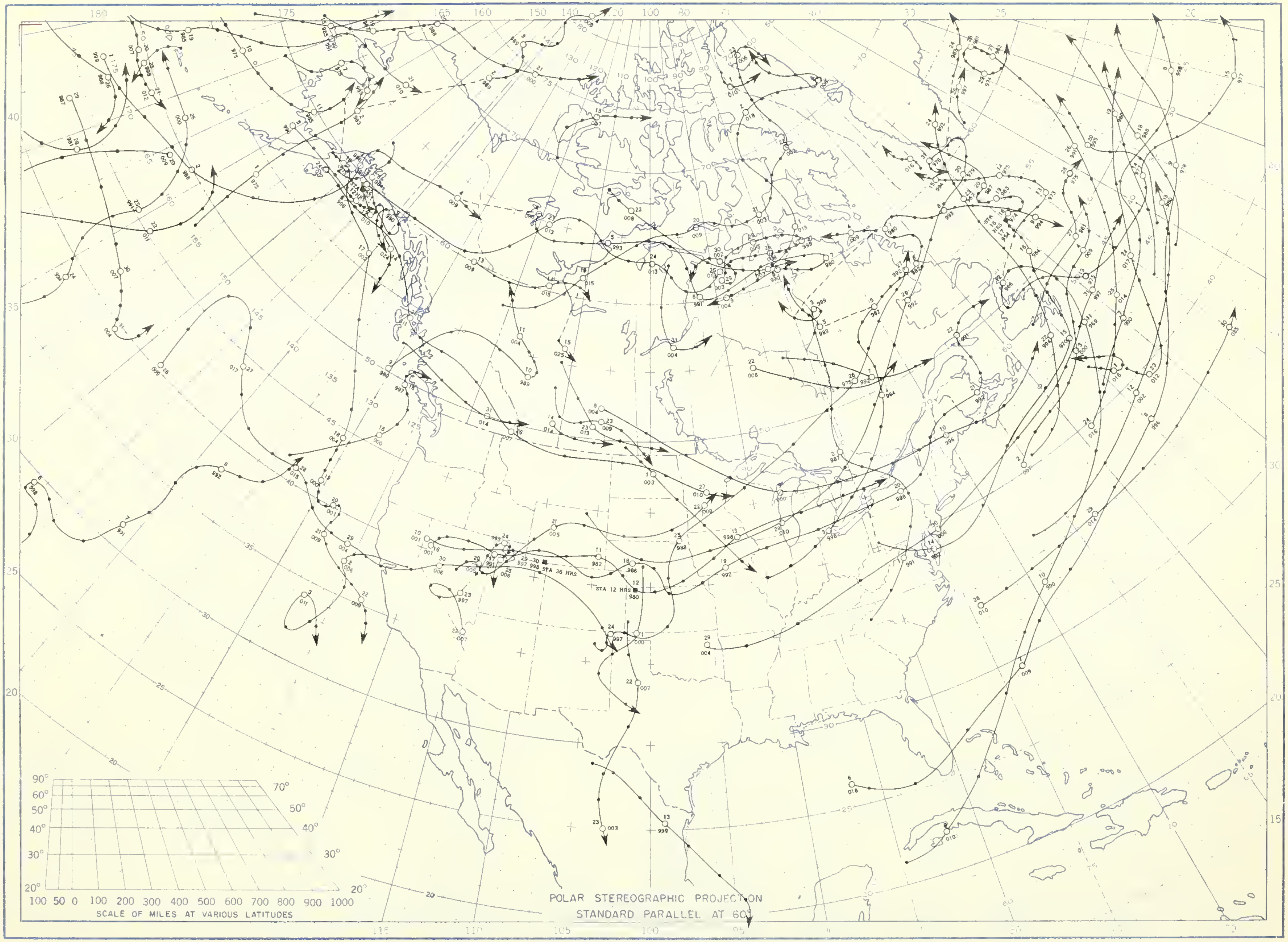
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm.$^{-2}$). Basic data for isolines are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are computed for stations having at least 9 years of record.

Chart IX. Tracks of Centers of Anticyclones at Sea Level, April 1954.



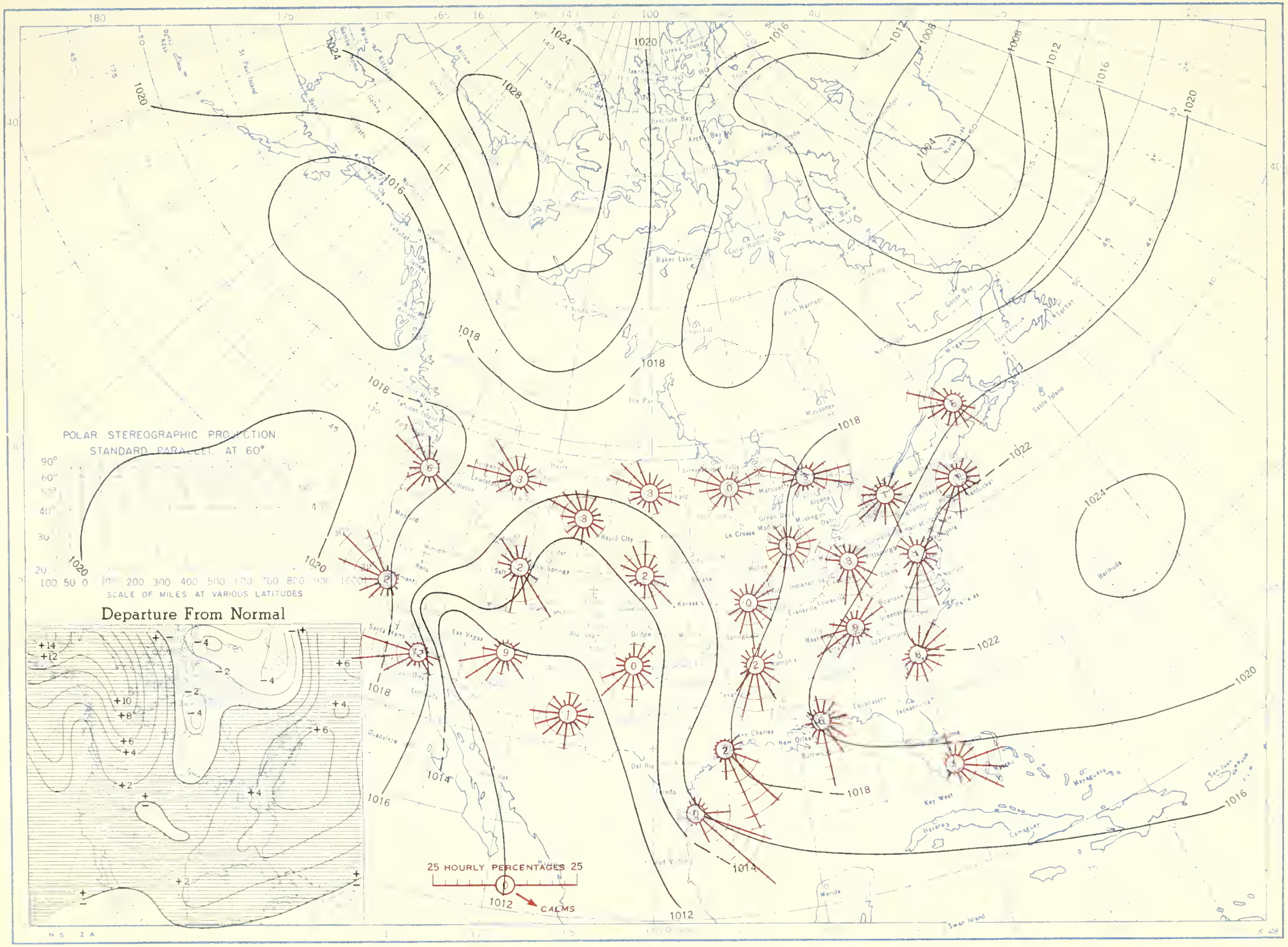
Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

Chart X. Tracks of Centers of Cyclones at Sea Level, April 1954.



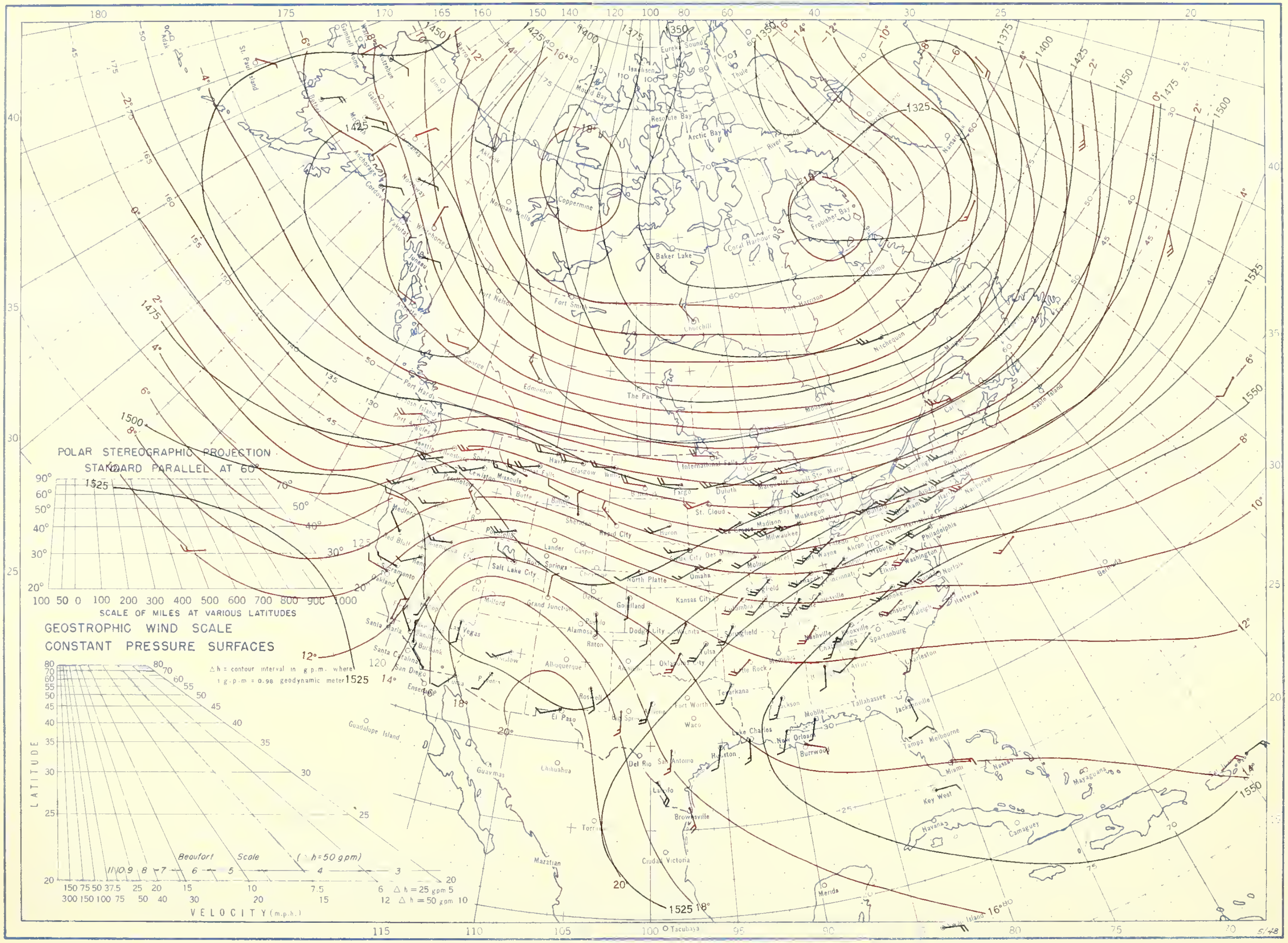
Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, April 1954. Inset: Departure of Average Pressure (mb.) from Normal, April 1954.



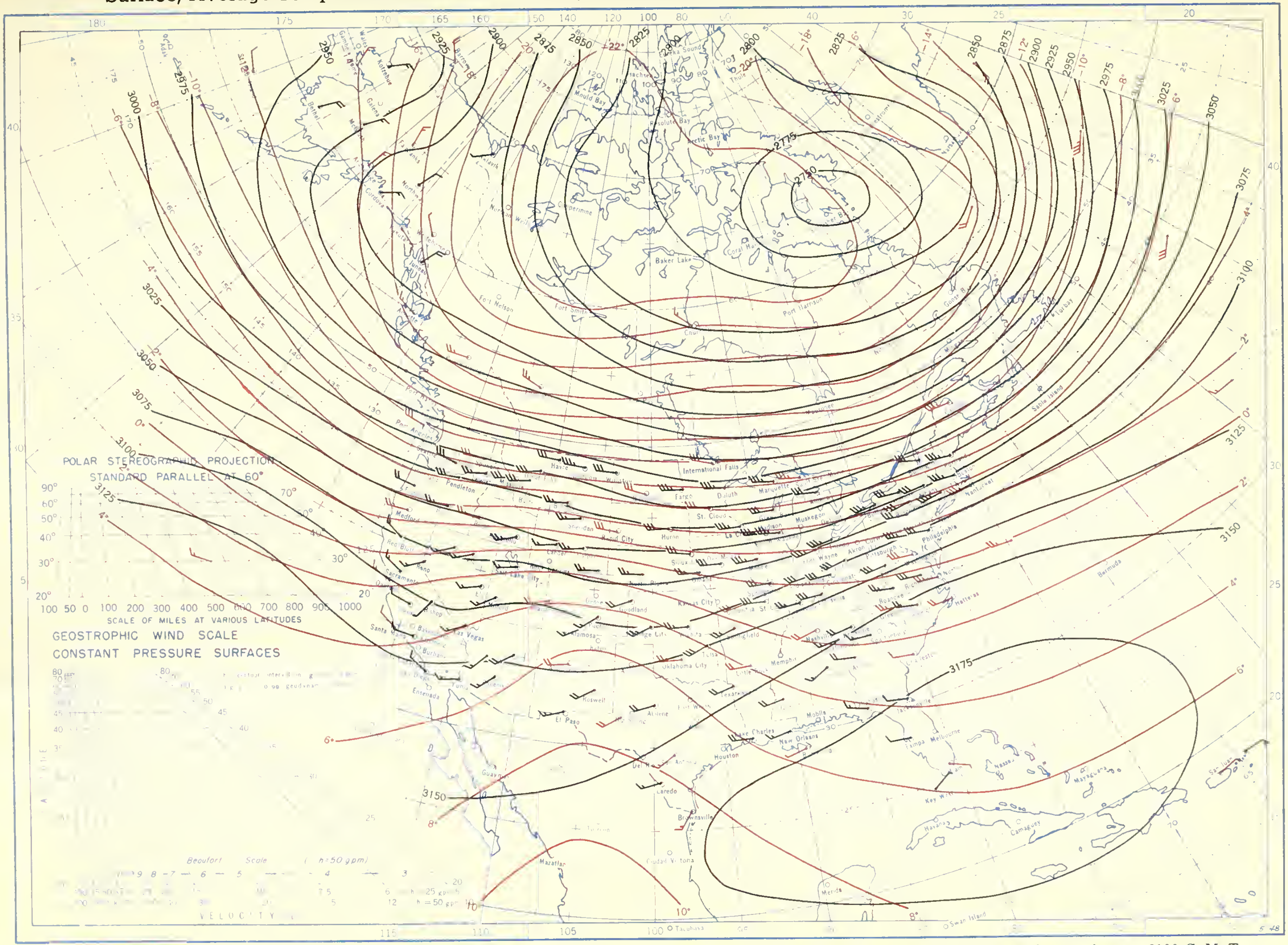
Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), April 1954.


POLAR STEREOGRAPHIC PROJECTION
STANDARD PARALLEL AT 60°
SCALE OF MILES AT VARIOUS LATITUDES
GEOSTROPHIC WIND SCALE
CONSTANT PRESSURE SURFACES
Δh = contour interval in g.p.m. where 1 g.p.m. = 0.98 geodynamic meter
Beaufort Scale
VELOCITY (m.p.h.)
LATITUDE
1325
1350
1375
1400
1425
1450
1475
1500
1525
1550
5/48

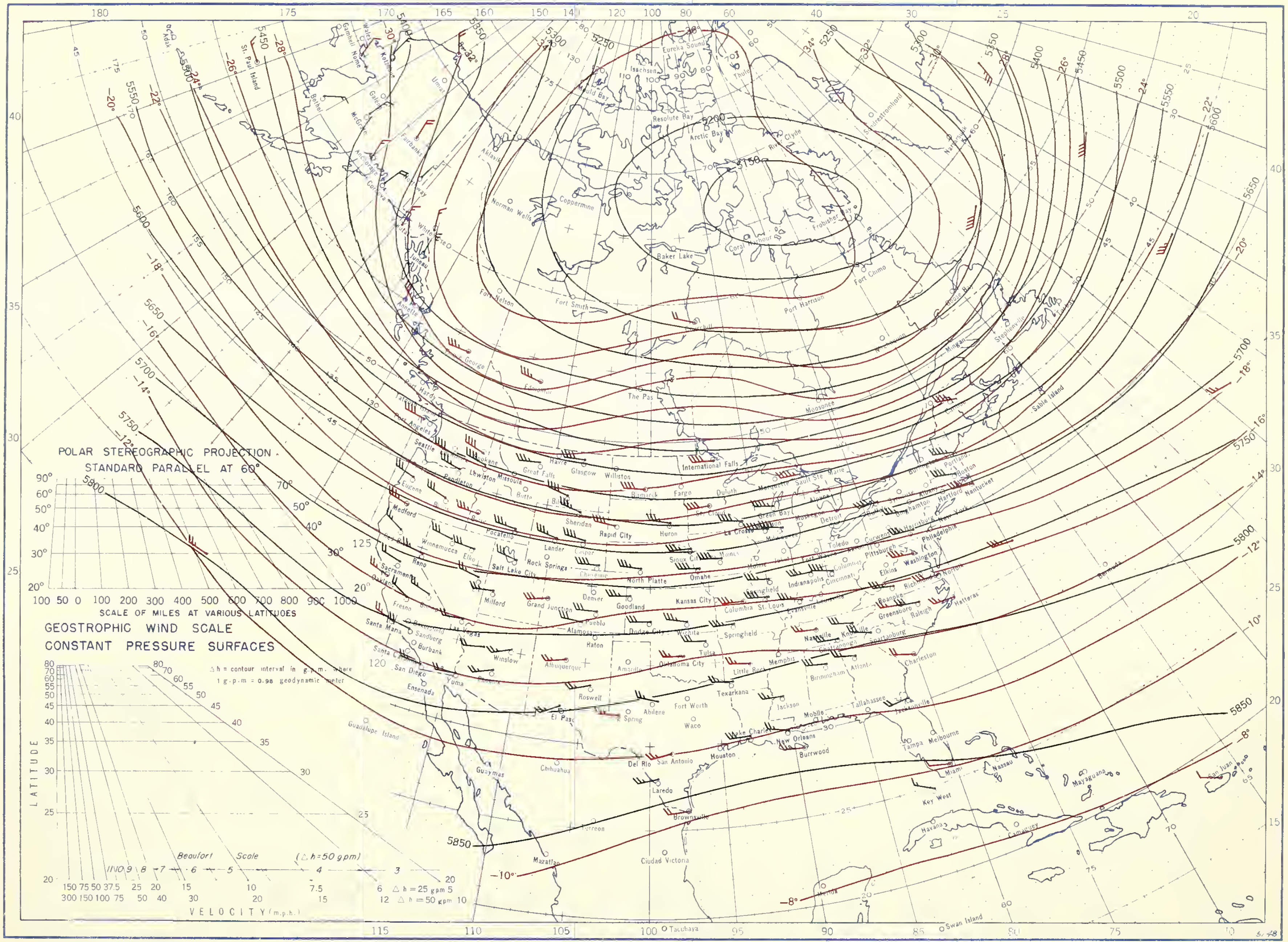
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m.. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), April 1954.



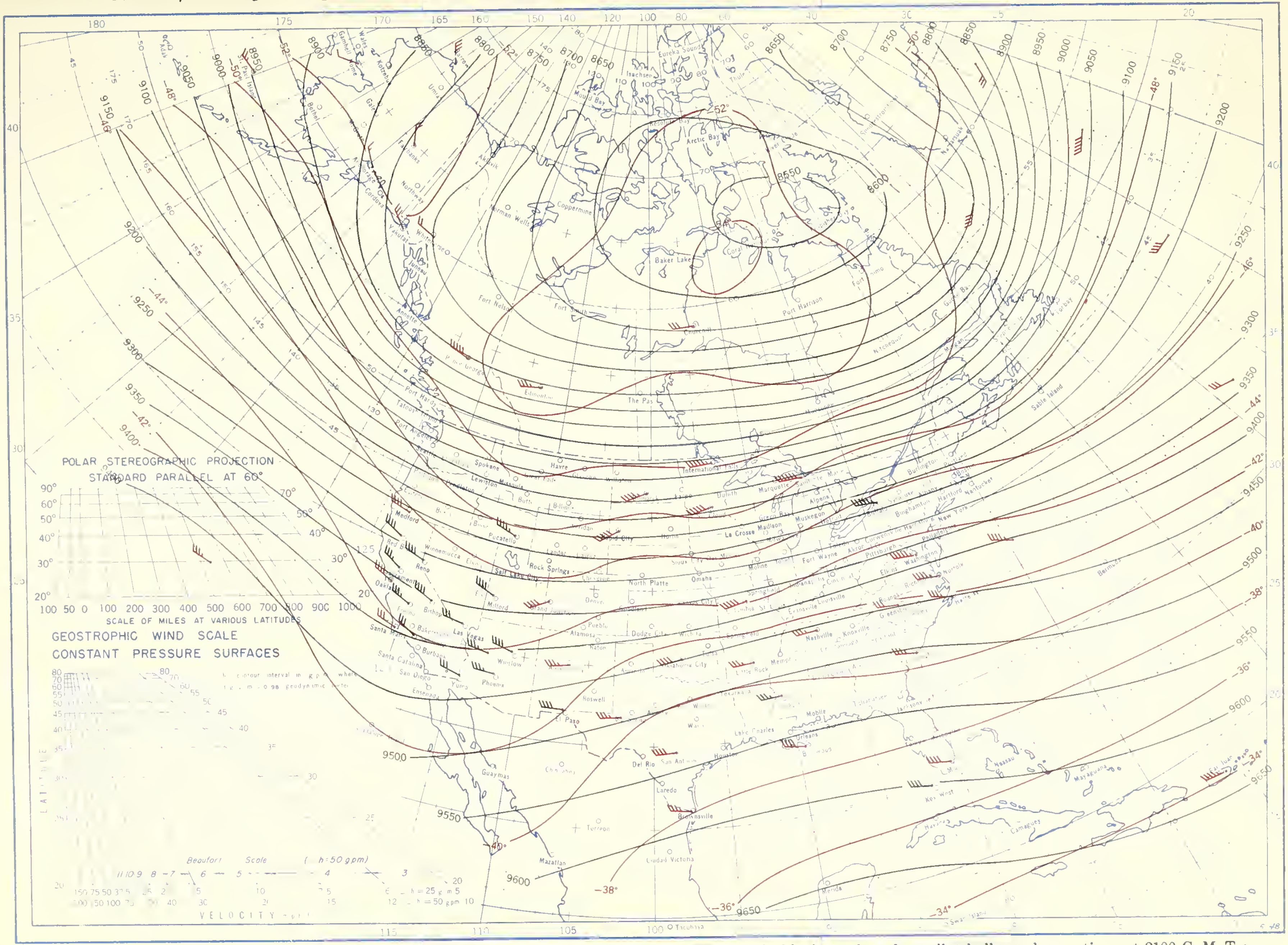
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), April 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 300-mb. Pressure Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), April 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

MAY 1954
Volume 5 No. 5

ASHEVILLE: 1954

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CHARTS I-XV

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

Volume 5 No. 5

MAY 1954

GENERAL SUMMARY OF WEATHER CONDITIONS

Except in the far West, May 1954 was notable for its abnormally cold weather. East of the Continental Divide temperatures, persistently below normal until the last few days, were more like those for March than for May. During the first few days of the month snowfall was widespread in northern areas and frost and freezing caused crop damage in the Northwest and South. In the latter area a considerable acreage of cotton had to be replanted, and growth of most other crops was retarded. In parts of the South it was the coldest May on record and was also colder than the preceding April. In the far West the month was abnormally warm, except for brief cold snaps at the beginning and end.

Precipitation, slightly below normal for the Nation as a whole, was well above normal along most of the Atlantic Coast and in an area extending from southern New Mexico to Arkansas and some adjacent areas and thence northward to the Canadian Border. At the end of the month soil moisture conditions were fairly good to good, except in the east Gulf Coastal area, in some extreme western sections of the central and lower Great Plains, and in parts of the far Southwest where the soil was quite dry. Thunderstorm frequency was generally below normal except in Kansas and Oklahoma and some adjacent parts of Colorado and Texas where it was slightly above.

Sunshine was above normal in the far West, slightly below normal in most other sections, and much below normal along the north Atlantic Coast where Providence, R.I., received only 40 percent of the possible (a May record).

TEMPERATURE.--The abnormally cold weather of May first affected the far West where it was a continuation of a cold spell that began near the end of April, and by the 4th the cold was felt in most areas east of the Rocky Mountains. On the 1st many stations in the Northwest recorded new May minima, two of which were the lowest on record for Oregon (-2° at Fremont) and Montana (-5° at Polebridge). Also on the 1st, Cheyenne, Wyo., recorded a record low May maximum temperature of 26°. The Montana low was also the month's lowest for the United States. These low temperatures caused extensive crop damage: berries, fruit, vegetables and some other crops were hard hit in Washington; cherries and pears were damaged in Oregon; nearly all fruit was destroyed in the vicinity of Mount Shasta, Calif., where a minimum of 21° was recorded; and fruit and vegetables were nipped in the Reno, Nev., area.

On the 3d and 4th temperatures fell to record low levels for May at a few southern stations and to near record low levels over the entire Central Interior. A 32° minimum at Oklahoma City, Okla., on the 3d was the latest freeze there on record; on the 4th Dallas, Texas, had a minimum of 39° (a new May record); frost at Vicksburg, Miss., on the 4th, the latest there on record, killed much young cotton; and a freeze at Amarillo, Tex., with a minimum of 28° caused considerable wheat damage.

The cold weather east of the Rockies, continuing until the last week when temperatures rose to near or above normal levels, resulted in the lowest average temperatures for May in most of the South since 1917 the year that Arkansas, Louisiana, and all States east of the Mississippi River except Wisconsin, Michigan, New England, and Florida had their coldest May on record. Statewide averages for South Carolina (66.5°) and Georgia (67.2°) were the lowest on record for May, and for Louisiana equaled the previous record of 69.6° in 1917. Also, for the following States, May averages were as low or lower than the April averages: Missouri (April, 62.0°; May 60.8°), Louisiana (April, 70.6°; May, 69.6°), Georgia (April, 68.3°, May 67.2°), Mississippi (April 62.0°; May 60.8°), South Carolina (April 66.5°; May, 66.5°).

The cold snap in the far West at the beginning of the month lasted only a few days after which abnormally warm weather set in and continued until near the end when a second period of abnormally low temperatures caused some slight crop damage in Idaho and frost over most of Utah. On the 18th, 19th, and 20th maximum temperatures, ranging in and above the 90's, established a new May maximum of 91° for Lander, Wyo., and an early season high of 93° for Pocatello, Idaho. On the 18th Cow Creek, Calif., recorded 115° for the month's highest temperature.

PRECIPITATION.--Precipitation, which totaled over 4 inches in several sections along the Atlantic Coast and in a large area including much of the Mississippi Valley and central and lower Great Plains, and over 2 inches in most of the remainder of the eastern two-thirds of the Country, was very helpful in replenishing and maintaining ample soil moisture reserves for the coming crop season. This was particularly true in much of the South Central Interior and an area extending from the central Great Plains to the Atlantic Coast where moisture supplies were low as a result of the 1953 drought and below normal precipitation during the first 4 months of 1954. May rains totaling over 6 inches in the vicinity of Springfield, Mo., broke the drought that had persisted there for more than 2 years. At Shreveport, La., May was the first month with above normal precipitation (8.30 inches) since December, 1953. Concordia, Kans., had 5.79 inches, which was the greatest monthly total there since July 1951.

Unusually heavy rainfall in New England resulted in flooding that caused several million dollars damage, but also provided an excellent water supply. The average precipitation for the section, 6.21 inches, was 2.69 inches above normal and the second highest average for May on record. Heaviest amounts fell in eastern Massachusetts where Spot Pond reported the greatest monthly total, 13.54 inches. Boston had 13.38 inches for the month, which was the greatest amount there for any month during the past 136 years.

One area that had below normal precipitation and remained dry at the end of the month extended from southeastern Louisiana and southern Mississippi to the Atlantic Coast. The period January through May was the driest on record at Mobile, Ala., and for the same period Columbus, Ga., reported a rainfall deficiency of 10.41 inches.

In the far West precipitation was below normal, although very beneficial showers fell in northern districts during the last week. At Lewiston, Idaho, drought conditions, which were becoming critical, were relieved by rains beginning the 24th. For California, Nevada, and parts of Oregon this was one of the driest Mays on record. One hundred sixty seven stations in California reported no measurable rain, and Las Vegas, Nev., had no measurable rain during either April or May.

SNOWFALL.--The month's heaviest and most extensive snowfall occurred in the North-Central Interior during the first 4 days. In the western Great Plains 3- to 7-inch falls were measured as far south as northwestern Kansas. Heavier falls were reported in the extreme upper Mississippi Valley and Great Lakes region where depths ranged up to 15 inches in the Ely Woods sections of Minnesota, 10 inches at Mellen and Ashland, Wis., and 14 inches at Bergland, Mich. As a result of the heavy snow during this storm and additional lighter falls on later dates, the snowfall for Minnesota averaged 4.4 inches, the highest on record for May.

Snowfall in the Northeast was negligible, except in the mountains where some heavy falls occurred on the 9th and 10th. On the latter date 5 to 10 inches blocked some roads in the Pocono area of eastern Pennsylvania, and 6 inches were reported on Mount Greylock in western Massachusetts. From the 5th through the 12th up to 12 inches fell in the mountains of northern New England.

Snowfall was very light in most of the far West. In the Sierra Nevada Mountains measurable amounts were reported by only 2 stations - 1 inch by Twin Lakes and by Giant Forrest, Calif. Owing to previous falls, however, the snowpack in the northern mountain ranges from northwestern Montana to the Cascades was unusually heavy at the beginning of the month, and despite rapid melting during the first 3 weeks much snow was still left at the end. Flooding along the Kootenai River, as a result of the rapid snowmelt, caused $1,250,000 damage in northern Idaho and some damage in Montana. Streams were near flood stage in Washington before cooler weather during the last week reduced the snowmelt.

DESTRUCTIVE STORMS.--During May 1954, storms were responsible for 47 deaths, 164 injuries, and more than $12 million damage, over one-half of which was caused by hail and tornadoes.

One hundred two tornadoes caused 8 deaths, 121 injuries, and losses estimated in excess of $4 million. The most destructive single tornado occurred in Michigan, causing $500,000 property damage along a path through Bangor to Grand Junction on the 31st. Another tornado on the 30th, left a path of devastation in northeastern Nebraska where 6 persons were killed and 17 injured, and where property losses were estimated at $450,000.

The worst hailstorm of the month occurred in southeastern Nebraska on the 1st. Covering most of Jefferson and parts of Saline and Thayer Counties, it damaged crops (mostly winter wheat) to the extent of $2,500,000. Four hundred thousand dollars additional crop damage, winter wheat again being the chief sufferer, occurred in Nebraska on the 15th when hail fell in parts of Adams, Box Butte, Deuel, Keith, Otoe, and Seward counties; 5 persons were injured in Keith County. Other major heil losses during the month were: $500,000 in Howard County, Ark., on the 29th; $500,000 in widespread sections of North Carolina on the 20th, and $274,000 in western South Carolina on the same date; $310,000 at Crosley, Tex., on 22d, and $200,000 in Gray County, Kansas, on the 30th.

Heavy rains and resulting floods caused damage estimated at several million dollars in New England from about the 8th through the 11th, and about a million dollars total at Clayton, Roswell, and Lovington, N. Mex., on the 17th.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

MAY 1954

Section	Temperature								Precipitation					
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes			
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least
	°F.	°F.		°F.			°F.		In.	In.		In.		In.
Alabama	66.4	-5.0	2 Stations	98	31	Tuskegee	33	°5	2.24	-1.63	Melvin	5.99	Headland	0.31
Arizona	67.8	2.0	do	105	°18	Maverick	10	2	.46	.14	Stanton	1.54	16 Stations	.00
Arkansas	64.8	-4.3	3 Stations	95	°30	Green Mountain	26	4	5.43	.32	Portland	10.93	Lead Hill	2.17
California	65.5	2.4	Cow Creek	115	18	Twin Lakes	12	1	.12	-.72	West Point 3SW	.95	102 Stations	.00
Colorado	54.3	1.7	Delta	99	20	2 Stations	6	2	1.45	-.30	Nortb Lake	4.57	Delta	.12
Connecticut	55.1	-2.4	Norwalk	85	31	Falls Village	25	6	4.03	.18	Thompsonville	5.41	Baltic	2.83
Delaware	61.0	-2.2	Georgetown	89	3	Georgetown	35	6	2.85	-.84	Middletown 2S	4.30	Wilmington City Hall	1.81
Florida	74.5	-1.2	6 Stations	95	°10	3 Stations	41	°5	4.64	.79	Fort Lauderdale 7W	16.06	Cedar Key	.15
Georgia	67.2	-4.9	Dublin	100	30	Blairsville Exp. Sta.	30	°6	2.78	-.65	Lafayette	6.00	Franklin	.99
Idaho	55.1	1.9	Grand View	104	19	Stihnite	3	1	.87	-.72	Fenn RS	4.03	4 Stations	.00
Illinois	59.0	-3.7	Golconda Dam	98	31	Stockton	26	6	2.77	-1.36	Ste. Marie	5.85	Rockport	.48
Indiana	57.5	-4.5	4 Stations	93	31	2 Stations	25	10	2.75	-1.35	Decatur	5.49	Elkhart	.60
Iowa	55.6	-4.8	2 Stations	91	°15	Carroll 2SSW	21	4	3.89	-.06	Lamoni CAA AP	6.99	LeClaire L & D 14	1.20
Kansas	59.9	-3.9	4 Stations	97	°21	Johnson 10ESE	24	3	4.43	.66	Burr Oak	9.26	Ricbfield 10WSW	.82
Kentucky	60.4	-4.9	Grayson	95	31	3 Stations	28	°4	3.12	-.87	Pikeville	5.47	Covington WB AP	1.33
Louisiana	69.6	-4.2	2 Stations	95	°29	Pollock Forest Nur.	37	5	6.82	1.69	Vidalia Natcbez	19.64	Quarantine	1.58
Maine	50.9	-1.6	Fort Kent	88	15	2 Stations	27	13	5.70	2.42	Sanford 2NNW	11.48	Stratton	3.55
Maryland	60.6	-2.2	7 Stations	90	°2	do	25	5	2.86	-.87	Cbestertown	4.66	Middle River	1.04
Massachusetts	54.4	-2.1	Lexington	88	29	West Cummington	26	°6	7.05	3.54	Spot Pond	13.54	Provincetown 3N	2.49
Michigan	49.9	-4.0	2 Stations	88	°24	Champion Van Riper Pk.	11	6	2.38	-.94	Bergland	7.31	Port Huron	.26
Minnesota	49.7	-5.2	Winona	89	24	4 Stations	19	°3	3.33	+.18	Stillwater	6.13	New London	1.45
Mississippi	67.2	-4.6	Jackson WB AP	98	30	Holly Springs 2N	35	4	5.72	1.36	Natchez	18.07	Van Cleave	.75
Missouri	60.8	-3.8	St Charles	94	31	Hermitage	24	4	4.37	-.41	Milan	7.48	Gregory Landing	1.36
Montana	51.2	-1.7	2 Stations	96	19	Polebridge	-5	1	1.26	-.73	Edgar 10SE	3.74	Harlowton	.04
Nebraska	56.1	-3.2	Benkelman	97	21	Harrison	5	3	3.27	-.16	Weeping Water	8.01	Purdum	.51
Nevada	61.5	4.5	Overton	107	°18	Virgin Valley	8	1	.14	-.64	Lehman Caves NM	.84	22 Stations	.00
New Hampshire	52.2	-1.8	Windham	87	1	Fahyan	25	13	8.07	4.70	Durham	12.00	Lancaster	3.68
New Jersey	58.3	-2.3	2 Stations	88	°29	2 Stations	26	°6	3.93	+.05	Cedar Grove	6.11	Deepwater	1.70
New Mexico	61.7	+.7	do	99	°9	do	16	°1	1.42	+.23	Lovington 1WNW	6.38	Buckhorn	.00
New York	53.8	-2.0	do	88	°29	Speculator	19	°5	3.60	-.05	Edgewood	9.85	Mt. Morris 2W	.88
North Carolina	63.3	-4.1	Laurinhurg	97	30	2 Stations	25	11	4.08	.14	Weldon	8.75	Higblands 2S	1.63
North Dakota	50.0	-3.9	2 Stations	92	20	Bowman Court House	10	3	2.05	-.22	Carrington	4.42	Watford City 14S	.72
Ohio	56.7	-3.9	do	94	°29	Philo	22	8	2.12	-1.61	Cbillicothe	4.07	Toledo Blade	.70
Oklahoma	64.3	-3.9	Goodwell	94	21	Goodwell	26	3	6.24	1.42	Valliant	13.07	Kenton 6N	1.27
Oregon	54.9	+.9	2 Stations	99	°18	Fremont	4	1	1.20	-.55	Government Camp 2E	5.66	Williams 1SW	T
Pennsylvania	56.2	-3.4	Johnstown	93	3	Donegal	22	5	3.36	-.71	Cogan Station 2N	6.95	Midland Dam 7	1.21
Rhode Island	54.6	-1.3	Kingston	84	1	2 Stations	33	°13	5.53	2.06	Greenville	5.93	Austin	4.55
South Carolina	66.5	-4.5	2 Stations	96	°30	Union 7SW	34	10	3.37	-.11	Hampton	8.21	Oakway	1.46
South Dakota	53.4	-3.0	4 Stations	97	20	Deadwood	4	3	2.42	-.43	Sisseton 3E	9.15	Highmore 1W	.44
Tennessee	61.9	-5.0	Columbia 1WSW	94	31	3 Stations	29	°5	3.71	-.40	Cosby	6.87	Monsanto	1.72
Texas	70.1	-2.4	Boquillas RS	109	°10	Vega	25	3	3.71	.30	Bon Weir	13.91	Mercedes 7S	.16
Utah	59.5	3.8	3 Stations	98	°17	Silver Lake Brighton	10	2	.85	-.24	Kanosh	3.28	Gunlock P8	T
Vermont	52.6	-1.4	Saint Johnsbury	88	16	Lemington	23	27	5.16	1.79	White River Jct.	7.61	Essex Junction	3.21
Virginia	60.7	-3.5	3 Stations	92	°3	Burkes Garden	25	°5	4.20	.39	Sussex	8.19	Warrenton 5NE	1.94
Washington	55.0	-.3	do	98	°18	Republic	11	1	1.34	-.56	Spirit Lake RS	5.47	White Swan	T
West Virginia	57.2	-4.5	Huntington WB CO	94	31	2 Stations	23	°5	3.60	-.43	Bluestone Dam	8.14	Petersburg WB CO	1.64
Wisconsin	50.2	-5.0	West Allis	88	31	3 Stations	17	°6	3.79	.28	Ashland Exp. Farm	6.56	Burlington	.97
Wyoming	51.3	1.3	Morrisey	96	20	Alva 5SE	-3	3	1.33	-.65	Pine Bluffs	3.43	Wamsutter 1N	.13
Puerto Rico	77.6	.7	Mayaguez	96	7	Garzas Dam	52	°4	4.99	-2.71	Dos Bocas	15.74	Potala	.10

° Other dates also.

Note: Dates in Table 1 apply to the period 24 hours prior to time of observation. In some cases the actual occurrence is on the calendar date preceding that shown. (See individual Climatological Data for times of observations).

Table 2

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
ALABAMA																																
Birmingham	610	990.5	1015.5	77	54	65.1	-4.4	92	31	39	°5	2	0	53	67	3.23	-0.51	1.67	8	3	0.0	0	5.1	N	39	NW	°3	9	5	17	6.5	59
Mobile	211	1007.8	1015.6	81	60	70.5	-2.9	91	30	46	°5	2	0	58	70	2.93	-1.71	2.05	8	5	.0	0	10.3	N	--	---	--	8	12	11	5.6	--
Montgomery CO	201	------	------	79	59	68.8	-4.7	96	30	46	4	2	0	--	--	1.32	-2.04	.58	6	2	.0	0	----	---	--	---	--	--	--	--	---	--
Montgomery	198	1008.1	1015.4	80	57	68.2	-4.3	96	31	44	6	2	0	56	67	1.48	-1.98	1.02	7	5	.0	0	6.7	NW	28	W	13	9	7	15	6.3	59
ARIZONA																																
Flagstaff	6993	------	------	70	36	53.0	3.0	77	°7	20	2	0	7	--	--	.44	-.09	.10	3	3	3.5	8	----	---	--	---	--	18	5	8	4.0	--
Phoenix	1114	969.5	1007.9	93	63	78.2	2.7	99	20	48	2	28	0	42	29	.11	-.06	.11	1	1	.0	0	6.4	E	*45	SSE	20	24	4	3	2.4	95
Prescott	5014	344.6	1010.0	80	47	63.5	2.6	86	°7	33	1	0	0	29	31	.17	-.13	.09	2	3	T	T	9.3	SW	37	W	22	19	8	4	3.1	91
Tucson	2558	921.8	1008.0	91	61	75.9	2.8	97	8	46	2	24	0	28	22	.47	.26	.27	3	4	.0	0	7.4	SW	40	SE	20	23	5	3	2.4	96
Winslow	4880	848.6	1007.6	83	49	66.0	4.0	89	°15	33	2	0	0	27	26	.13	-.19	.06	3	2	T	0	10.2	WSW	*37	SSW	16	16	13	2	3.4	--
Yuma	199	1002.4	1007.4	97	65	81.2	.8	104	24	49	2	29	0	38	25	T	-.02	T	0	0	.0	0	10.7	SSE	35	S	19	26	4	1	1.4	97
ARKANSAS																																
Fort Smith	458	998.0	1014.8	77	54	65.3	-4.3	92	30	35	4	3	0	54	70	2.67	-2.39	1.14	13	10	T	T	7.5	NE	31	NW	31	7	10	14	6.4	61
Little Rock	257	1002.0	1015.1	77	56	66.6	-3.2	93	30	41	4	3	0	53	65	6.74	1.89	3.94	13	4	T	0	8.1	SSW	34	SW	2	7	11	13	6.2	65
Texarkana	361	1001.4	1015.0	77	58	67.0	-4.9	90	30	39	4	1	0	58	73	9.26	4.13	2.33	10	7	.0	0	----	---	--	---	--	7	9	15	6.2	--
CALIFORNIA																																
Bakersfield	489	993.6	1011.4	88	57	72.6	2.4	101	19	44	2	14	0	44	38	T	-.35	T	0	0	.0	0	7.0	NW	*23	NW	14	18	10	3	2.8	--
Bishop	4108	870.0	1008.5	88	46	66.9	4.3	100	18	31	1	14	2	--	--	.18	-.02	.18	1	0	.0	0	----	---	--	---	--	16	10	5	3.8	--
Blue Canyon	5280	837.8	1011.5	66	47	56.6	4.4	81	18	27	1	0	1	--	--	.21	-2.27	.21	1	0	.0	0	----	---	--	---	--	15	10	6	4.0	--
Burbank	699	986.5	1012.7	74	54	64.0	.0	86	3	45	2	0	0	51	70	.07	-.20	.02	5	0	.0	0	5.1	S	*16	SW	15	12	13	6	4.8	--
Eureka CO	43	1015.2	1017.6	57	47	51.5	-1.4	62	°6	36	1	0	0	--	--	.16	-1.66	.09	2	0	.0	0	7.3	---	31	N	21	5	8	18	7.0	54
Fresno	331	999.3	1010.8	86	54	69.7	.8	98	°18	41	1	9	0	45	47	.09	-.19	.09	1	0	.0	0	6.5	NW	28	W	14	15	12	4	3.5	94
Los Angeles CO	312	------	------	72	56	63.8	-1.0	86	3	49	1	0	0	52	71	.02	-.24	.02	1	0	.0	0	5.5	---	19	W	3	9	16	6	5.0	64
Los Angeles	99	1009.5	1012.9	68	56	61.6	-.5	77	3	50	°1	0	0	53	77	.02	-.28	.01	2	0	.0	0	6.7	WSW	†24	W	31	7	8	16	6.6	--
Mt. Shasta	3543	890.6	1013.7	72	41	56.5	3.0	91	18	21	1	1	2	--	--	.01	-1.66	.01	1	1	.0	0	----	---	--	---	--	13	8	10	4.6	--
Oakland	3	1014.2	1014.4	67	51	59.1	.7	82	22	44	2	0	0	47	70	.11	-.50	.11	1	0	.0	0	8.9	W	*29	W	29	10	11	10	5.0	--
Red Bluff	341	999.3	1011.9	86	55	70.4	2.4	100	16	43	2	8	0	43	42	.01	-1.05	.01	1	0	.0	0	8.5	WNW	26	NW	21	14	8	9	4.2	92
Sacramento	17	1010.8	1011.9	82	50	65.7	1.7	93	17	43	°1	4	0	46	57	.20	-.34	.20	1	0	.0	0	9.5	SW	31	SW	°8	15	12	4	3.5	84
Sandberg CO	4517	860.5	1009.8	73	50	61.6	4.9	88	18	31	1	0	1	--	--	.09	-.16	.09	1	0	.0	0	----	---	--	---	--	23	6	2	2.3	--
San Diego	19	1009.5	1012.8	68	57	62.9	-.3	78	3	50	2	0	0	52	72	.01	-.25	.01	1	0	.0	0	6.8	SSW	18	NW	2	8	10	13	6.2	46
San Francisco CO	52	------	------	62	50	56.2	-.9	80	22	48	7	0	0	--	--	.11	-.48	.11	1	0	.0	0	11.3	---	31	W	24	12	11	8	4.6	79
San Francisco	1	1013.5	1014.1	66	48	56.7	.1	83	22	42	°2	0	0	48	78	.07	-.33	.07	2	0	.0	0	15.5	W	40	W	20	11	11	9	4.8	--
Santa Maria	231	1005.1	1013.9	69	47	57.7	.0	82	31	37	1	0	0	48	75	.02	-.30	.02	1	0	.0	0	7.3	W	*24	W	10	13	12	6	4.1	--
COLORADO																																
Alamosa	7534	770.7	1013.6	70	36	52.9	2.1	79	°19	25	3	0	7	--	--	.78	.21	.39	8	7	1.1	T	----	---	--	---	--	9	15	7	5.3	--
Colorado Springs	6173	810.4	1014.0	67	42	54.2	-1.2	88	20	21	2	0	3	36	58	2.57	.51	1.08	11	7	2.4	4	11.3	SSE	*35	W	13	7	14	10	5.7	--
Denver	5292	835.4	1011.3	70	44	57.2	.9	91	20	22	2	1	3	34	49	.60	-1.60	.29	5	2	2.8	4	11.0	S	34	W	12	5	14	12	6.3	66
Grand Junction	4849	856.1	1009.2	79	50	64.4	2.3	90	°19	36	°2	2	0	32	34	.54	-.14	.30	5	6	.0	0	9.4	ESE	45	SW	25	11	12	8	4.7	78
Pueblo	4799	855.4	1012.4	73	46	59.9	.7	94	20	25	2	2	3	40	56	1.69	-.04	.96	10	7	4.5	4	7.8	SE	38	W	13	5	16	10	6.0	57
CONNECTICUT																																
Bridgeport	7	1013.2	------	65	49	57.1	-.1	81	31	42	°14	0	0	--	--	3.17	-.43	1.15	7	4	.0	0	----	---	--	---	--	3	11	17	7.3	--
Hartford	15	1007.8	1013.7	67	47	57.0	-1.9	83	31	38	14	0	0	46	71	3.90	.13	1.09	15	3	.0	0	7.9	S	26	SW	28	3	11	17	7.7	56
New Haven	6	1009.1	1012.9	64	47	55.2	-1.5	78	30	38	14	T	T	--	--	4.26	.39	1.99	14	5	T	T	7.2	---	30	E	8	3	11	17	7.5	47
DELAWARE																																
Wilmington	73	1010.8	1013.9	71	50	60.6	-2.2	86	2	40	°10	0	0	48	67	2.38	-1.43	.74	12	2	.0	0	8.3	NW	--	---	--	4	8	19	7.3	--
DIST. OF COLUMBIA																																
Washington CO	72	------	------	73	54	63.2	-2.0	89	°3	41	5	0	0	--	--	3.19	-.72	1.96	11	5	T	T	7.4	---	28	W	10	--	--	--	---	--
Wash. Nat'l. AP	14	1010.2	1014.3	72	54	62.6	-2.1	87	3	40	5	0	0	48	63	2.98	-1.00	1.45	13	5	.0	0	9.9	NW	43	N	3	3	13	15	7.0	57
FLORIDA																																
Apalachicola CO	13	1013.2	1014.2	79	65	71.9	-2.5	83	°31	53	5	0	0	--	--	1.54	-1.29	.67	7	3	.0	0	7.9	---	23	SE	24	15	10	6	4.1	71
Daytona Beach	31	1013.2	1014.7	83	64	73.7	-.7	90	°8	55	22	2	0	64	75	3.21	-.06	2.22	9	7	.0	0	10.5	SW	*25	SW	13	12	12	7	5.1	--
Fort Myers	15	1014.2	1013.9	87	67	76.8	-.1	91	1	58	6	3	0	67	75	4.08	-.21	1.54	10	7	.0	0	8.0	E	*30	SW	13	13	11	7	5.4	--
Jacksonville CO	18	------	------	83	64	73.5	-1.7	89	°30	54	5	0	0	--	--	.88	-2.75	.50	6	--	.0	0	----	---	--	---	--	--	--	--	---	--
Jacksonville	24	1013.9	1014.5	84	62	72.8	-2.1	91	3	51	22	3	0	59	66	.73	-2.70	.26	8	3	.0	0	8.8	ESE	30	NW	19	9	15	7	5.3	64
Key West	5	1012.5	1013.2	86	74	80.1	.3	88	°29	66	7	0	0	71	76	2.94	.12	.91	7	5	.0	0	6.9	---	18	SE	13	8	8	15	6.3	74
Lakeland CO	214	------	------	85	66	75.7	-.8	91	12	60	°22	2	0	--	--	3.99	-.60	1.04	9	7	.0	0	6.6	---	--	---	--	12	11	8	5.3	54
Miami CO	8	------	------	83	72	77.5	.4	89	20	64	6	0	0	--	--	10.11	5.84	3.75	13	11	.0	0	10.3	---	40	S	13	8	12	11	6.0	61
Miami	8	1012.5	1013.5	87	72	79.2	1.2	92	20	65	6	6	0	69	74	13.43	7.88	4.02	17	9	.0	0	8.8	SSE	*25	WSW	13	6	14	11	6.3	--
Miami Beach	9	------	------	84	74	79.0	.6	90	20	68	°15	1	0	--	--	11.29	7.36	5.90	12	--	---	-	----	---	--	---	--	12	5	14	---	--
Orlando	106	1010.2	1014.3	85	65	75.3	-1.2	91	11	57	23	3	0	64	73	3.55	-.47	1.40	9	6	.0	0	8.8	NE	*28	SSW	4	13	12	6	5.2	--
Pensacola CO	13	1012.2	------	78	63	70.4	-3.4	85	30	47	5	0	0	--	--	2.22	-2.14	1.74	6	1	.0	0	----	---	29	SW	3	--	--	--	---	72
Pensacola CAA AP	118	------	1014.9	--	--	----	----	--	--	--	--	--	--	60	--	-----	-----	----	--	--	---	-	----	---	--	---	--	--	--	--	---	--
Tallahassee	64	1012.2	1014.6	83	60	71.6	-2.6	91	31	48	22	3	0	56	64	3.12	-.64	.92	9	3	.0	0	5.3	NNW	--	---	--	9	13	9	5.4	--
Tampa	19	1012.5	1014.3	85	66	75.3	-1.2	90	°10	59	6	2	0	64	71	5.90	2.61	2.45	10	7	.0	0	9.1	E	*25	SSE	12	14	10	7	4.5	76
West Palm Beach	15	1012.5	1013.4	86	70	78.2	1.1	91	9	64	6	3	0	69	77	7.87	2.81	2.97	17	8	T	T	9.6	ESE	*45	W	13	9	9	13	6.2	--
GEORGIA																																
Albany	190	1007.8	1014.9	82	59	70.6	-4.3	94	°31	47	5	4	0	55	61	2.35	-1.66	.94	7	5	.0	0	4.0	NW	--	---	--	4	14	13	6.6	--
Atlanta	977	974.6	1015.8	75	54	64.2	-5.8	91	31	41	°5	1	0	50	65	3.31	-.51	1.83	7	3	.0	0	8.9	NW	36	N	3	7	9	15	6.1	62
Athens	798	986.1	------	77	53	65.1	-5.3	90	°31	41	5	2	0	--	--	2.51	-1.32	.82	7	2	.0	0	----	---	--	---	--	11	10	10	5.0	--
Augusta	143	1008.1	1014.7	80	53	66.2	-6.7	92	30	42	°22	1	0	55	70	2.63	-.65	2.08	6	3	.0	0	5.9	NW	*38	WNW	3	7	11	13	6.2	--
Columbus	385	1001.4	1015.2	79	55	66.2	-5.4	93	31	44	°5	2	0	--	--	2.26	-.82	1.32	6	6	.0	0	----	---	--	---	--	9	8	14	6.1	--
Macon	356	1001.0	1014.5	80	56	68.0	-5.6	96	31	44	6	3	0	53	64	2.59	-.63	1.17	6	5	.0	0	8.3	NW	26	NW	3	8	14	9	6.2	71
Rome	637	992.6	1015.6	76	50	62.8	-6.4	93	31	37	6	2	0	--	--	3.95	-.12	1.74	9	3	.0	0	----	---	--	---	--	7	10	14	6.3	--
Savannah	48	1012.5	1014.8	80	57	68.9	-4.0	92	30	47	9	1	0	58	71	4.45	1.54	2.90	6	4	.0	0	7.6	WNW	24	NW	20	6	15	10	5.8	61
Valdosta	200	1006.8	1014.7	84	58	71.1	-3.1	95	30	45	7	6	0	57	--	1.19	-1.72	.64	7	6	.0	0	7.9	NW	--	---	--	8	15	8	5.4	--
IDAHO																																
Boise	2842	916.7	1011.8	75	45	59.9	1.8	93	18	27	°1	3	2	36	44	.95	-.14	.67	6	4	T	T	11.1	NW	50	W	31	10	14	7	5.0	87
Idaho Falls, 46 W, CO	4933	845.9	1012.2	71	36	53.6	----	91	19	18	2	1	10	--	--	.45	-----	.27	5	0	.0	0	10.0	WSW	‡37	W	26	--	--	--	---	--
Idaho Falls, 43 NW, CO	4780	------	------	72	38	54.9	----	93	19	16	2	1	10	--	--	.40	-----	.23	4	0	.0	0	6.8	SSW	‡33	NNW	22	--	--	--	---	--
Lewiston	1413	962.4	1013.7	73	45	59.2	.3	94	18	23	1	1	2	--	--	.84	-.58	.31	7	1	.0	0	----	---	--	---	--	8	7	16	6.5	--
Pocatello	4444	860.1	1011.5	73	42	57.4	2.1	93	19	26	2	1	2	32	42	.87	-.34	.79	2	2	T	T	10.9	SW	39	SW	31	10	9	12	5.4	80
ILLINOIS																																
Cairo CO	314	1002.4	------	75	55	64.9	-3.9	91	31	40	4	1	0	--	--	4.67	.58	2.03	11	3	.0	0	7.6	---	29	S	2	3	13	15	7.0	63
Chicago	610	991.5	1014.5	68	47	57.1	-2.1	91	31	32	4	1	1	40	56	1.75	-1.91	.73	7	5	.2	T	10.6	W	38	W	2	6	12	13	6.2	61
Moline	589	993.2	1015.6	67	45	56.1	-4.8	82	31	32	°4	0	2	42	62	3.58	.14	2.60	8	5	T	0	9.3	NW	59	NW	3	7	13	11	5.9	57
Peoria	654	992.9	1015.3	68	47	57.5	-3.5	85	31	32	4	0	1	43	58	2.59	-1.35	1.08	6	6	T	T	11.4	---	55	SW	31	6	13	12	6.0	64
Springfield	587	992.2	1015.6	71	47	59.0	-3.0	89	31	30	4	0	1	45	62	1.95	-2.24	.99	7	4	T	0	12.3	WNW	42	SW	31	8	9	14	6.2	71
INDIANA																																
Evansville	383	1000.7	1016.3	72	49	60.8	-4.7	91	31	35	°4	1	0	49	68	3.45	-.45	.81	11	4	.0	0	8.0	WNW	29	N	19	3	12	16	6.9	65

See footnotes at end of table.

CLIMATOLOGICAL DATA

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature										Average dew point	Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below			Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F	°F	°F.	°F.	°F.		°F				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
INDIANA (Cont.)																																
Fort Wayne	801	983.7	1014.7	68	44	56.0	-3.0	88	31	31	4	0	2	42	62	4.14	0.70	1.85	10	4	T	T	12.0	WNW	50	NW	31	4	14	13	6.7	63
Indianapolis	793	986.1	1015.6	70	46	57.9	-3.5	89	31	31	°4	0	2	43	60	1.98	-1.87	.75	13	6	T	T	12.6	WNW	38	NW	3	4	12	15	6.7	52
South 8end	768	986.8	1015.0	66	43	54.3	-4.1	88	31	31	°4	0	4	42	64	2.47	-1.37	1.39	8	3	.5	T	11.0	NNW	•32	WSW	31	4	13	14	6.8	--
Terre Baute	578	994.2	1015.4	71	47	58.6	-4.1	92	31	33	°4	1	0	45	59	3.39	-1.04	2.10	10	6	T	T	10.9	S	34	NW	3	3	14	14	6.6	58
IOWA																																
8urlington	694	989.8	1015.6	68	46	57.0	-4.9	82	°15	31	4	0	2	43	61	3.96	.14	2.77	8	4	T	0	10.4	WNW	42	W	3	7	11	13	5.9	72
Des Moines	948	983.4	1015.9	68	46	56.8	-4.4	86	23	30	4	0	4	41	59	5.90	2.30	2.79	6	7	T	T	13.1	WNW	58	NW	3	9	12	10	5.9	60
Dubuque	1065	976.0	1015.4	64	43	53.7	-4.2	79	31	28	6	0	5	40	59	3.83	.36	2.36	9	3	T	T	----	---	--	---	--	5	10	16	6.6	--
Sioux City	1094	973.6	1015.1	68	45	56.6	-3.8	89	22	29	°3	0	4	40	57	2.51	-.83	.72	9	3	T	T	11.7	NNW	46	NW	3	7	14	10	6.1	72
KANSAS																																
Concordia CO	1375	965.1	------	69	50	59.7	-3.5	88	22	31	3	0	1	--	63	5.79	2.18	1.30	13	11	.0	0	7.5	---	35	W	31	9	8	14	6.3	51
Dodge City	2594	925.5	1013.3	69	49	59.0	-4.0	92	°21	29	3	2	2	48	71	2.29	-.62	.77	12	8	T	T	16.2	S	49	NE	•28	6	10	15	6.5	55
Goodland	3645	886.9	1013.3	68	43	55.3	-2.8	95	21	25	2	2	4	43	69	2.53	-.16	.79	13	11	3.1	3	12.0	SSE	•30	NNW	2	5	12	14	6.9	--
Topeka	879	979.3	1015.4	72	48	60.0	-3.8	90	22	32	°3	1	2	48	67	4.38	.06	.82	11	8	T	0	8.8	SSE	45	SW	31	10	4	17	6.3	55
Wichita	1321	965.8	1014.3	72	51	61.4	-3.5	89	22	33	3	0	0	49	67	4.84	1.05	1.88	9	7	.0	0	12.2	S	46	N	2	8	10	13	6.3	64
KENTUCKY																																
Lexington	979	979.7	1015.6	71	49	60.1	-2.5	91	31	32	4	1	1	47	64	2.23	-1.33	.80	10	2	.0	0	10.0	SSW	--	---	--	3	15	13	6.7	--
Louisville CO	457	------	------	71	53	62.0	-3.9	90	31	37	4	1	0	--	--	2.01	-1.81	.57	11	1	.0	0	----	---	--	---	--	--	--	--	---	--
Louisville	474	998.6	1014.9	73	50	61.1	-4.2	92	31	34	10	1	0	48	64	1.86	-2.07	.55	11	4	.0	0	7.5	S	32	W	2	4	14	13	6.2	61
LOUISIANA																																
Baton Rouge	64	1011.5	1014.4	82	60	70.7	-2.9	92	29	44	4	4	0	60	71	5.81	.89	4.96	7	4	.0	0	8.4	E	--	---	--	10	10	11	5.1	--
Lake Charles	12	1012.9	1014.2	81	62	71.6	-2.9	90	29	46	4	1	0	61	72	4.05	-.68	1.94	6	5	.0	0	7.9	N	--	---	--	7	14	10	5.5	--
New Orleans CO	9	1012.5	------	81	65	72.9	-3.2	89	31	50	4	0	0	--	--	5.11	-.32	1.92	8	4	T	0	6.6	---	21	NE	4	11	13	7	4.8	63
New Orleans	3	1012.5	1014.4	80	62	71.2	-3.4	89	29	51	4	0	0	61	74	4.45	-1.09	3.25	6	5	.0	0	8.8	ENE	•31	NE	4	10	14	7	4.8	--
Shreveport	252	1005.4	1014.9	79	59	68.8	-5.0	91	°30	44	4	2	0	58	73	7.94	3.39	2.69	11	7	.0	0	8.9	S	--	---	--	10	10	11	5.8	65
MAINE																																
Caribou	624	988.8	1013.9	57	40	48.7	.2	80	15	30	13	0	2	39	72	3.85	.71	.97	18	1	T	0	10.4	N	38	W	17	3	3	25	8.2	--
Portland	61	1009.5	1013.4	60	42	51.2	1.1	82	31	32	°14	0	2	44	80	6.73	3.37	2.17	19	0	.0	0	9.8	E	38	E	9	4	6	21	7.5	42
MARYLAND																																
Baltimore CO	14	------	- ----	72	56	63.8	-1.5	83	31	43	10	0	0	--	--	2.72	-1.29	1.10	10	--	---	--	----	---	--	---	--	--	--	--	---	--
Baltimore	146	1009.8	1014.7	71	51	60.8	-2.1	87	31	40	°11	0	0	48	63	2.07	-1.94	.88	12	3	T	T	9.4	NW	40	W	11	6	12	13	6.8	52
Frederick	294	------	------	70	48	58.8	-5.1	87	°31	35	5	0	0	--	--	3.48	-.12	1.88	12	2	.0	0	----	---	--	---	--	--	--	--	---	--
MASSACHUSETTS																																
8lue Hill Obs.	636	989.7	------	62	46	52.7	-2.4	80	°31	39	°14	0	0	--	77	9.16	5.66	3.12	15	1	.0	0	•13.6	W	35	W	11	3	11	17	7.4	40
8oston	15	1008.5	1013.2	63	49	56.3	-1.5	85	29	42	3	0	0	45	73	13.38	10.47	5.74	18	1	.0	0	12.7	W	42	NE	21	2	11	18	7.5	47
Nantucket	43	1012.5	1013.2	58	46	52.0	-.3	77	30	35	14	0	0	47	85	3.61	.70	1.95	12	1	.0	0	12.7	WSW	35	SW	11	4	7	20	7.5	55
Pittsfield	1153	------	------	62	42	52.0	-2.3	77	1	30	6	0	3	--	--	5.51	1.75	1.73	17	4	.0	0	----	---	--	---	--	--	--	--	---	--
MICHIGAN																																
Alpena CO	587	991.5	------	58	39	48.7	-2.2	81	1	28	°4	0	5	--	--	3.63	1.00	2.25	10	3	1.7	1	10.8	---	33	SE	7	10	12	9	5.4	66
Detroit	619	988.2	1014.9	66	44	54.7	-3.1	84	31	32	4	0	1	40	58	1.39	-2.22	.68	12	3	.1	T	10.8	W	50	W	31	6	13	12	6.3	64
Detroit (Willow Run)	722	986.1	1014.5	67	44	55.3	-2.9	87	31	30	4	0	3	39	58	1.74	-1.70	1.05	9	4	T	0	10.8	WNW	•37	SW	31	3	12	16	6.7	--
Escanaba CO	594	991.2	------	54	39	46.6	-3.2	76	24	23	5	0	7	--	--	2.02	-.58	.70	8	1	4.0	3	10.6	---	36	NE	2	8	9	14	6.2	61
Grand Rapids	681	989.2	1014.6	65	42	53.6	-2.7	86	31	30	°3	0	5	39	62	1.51	-1.94	.90	9	2	2.0	1	10.7	W	35	SW	31	5	15	11	6.3	54
Lansing	859	983.1	1015.1	65	42	53.0	-3.5	83	24	27	9	0	5	40	64	1.14	-2.61	1.07	8	2	.3	T	11.5	W	40	W	29	7	15	9	5.8	60
Marquette CO	677	986.5	------	52	37	44.4	-5.2	78	24	22	5	0	9	--	--	4.20	1.56	1.03	12	1	8.7	7	8.1	---	26	SW	1	5	8	18	7.1	53
Muskegon	627	991.5	1015.0	62	43	52.5	-1.8	82	31	32	8	0	1	37	56	2.53	-.29	1.35	7	3	.4	T	----	---	--	---	--	9	12	10	5.5	--
Sault Ste. Marie	721	991.2	1014.3	56	34	45.1	-3.8	75	°23	23	°4	0	13	37	74	1.85	-.70	1.24	11	1	1.6	T	10.3	WNW	33	W	25	7	9	15	6.3	53
MINNESOTA																																
Duluth	1409	972.6	1014.6	53	35	44.2	-5.5	75	21	20	3	0	10	34	72	4.47	1.30	1.50	17	3	8.1	4	14.6	NW	42	NW	°3	4	7	20	7.6	44
Intern'l Falls	1179	971.6	1015.2	54	36	44.9	-6.0	79	23	20	3	0	10	34	69	3.62	1.09	.92	17	2	13.4	12	11.7	---	--	---	--	3	5	23	8.0	--
Minneapolis	830	981.0	1014.9	62	44	53.1	-5.4	83	23	26	3	0	4	38	59	2.54	-.58	.72	7	3	2.4	2	13.8	NW	41	NW	24	9	8	14	5.9	54
Rochester	1017	977.3	1014.7	63	41	51.7	-5.1	84	23	26	3	0	7	37	61	3.93	.55	1.04	11	5	.7	1	11.0	NW	--	---	--	7	10	14	6.3	--
St. Cloud	1034	976.3	1014.6	61	39	50.2	-5.0	81	23	24	3	0	7	37	64	4.46	1.36	3.24	11	4	1.2	1	8.6	NW	--	---	--	8	10	13	6.2	--
MISSISSIPPI																																
Jackson	315	1003.1	1015.1	79	57	67.8	-4.5	98	30	42	4	5	0	57	72	8.30	4.21	4.63	10	4	.0	0	7.3	SSE	35	NW	3	9	10	12	5.7	59
Meridian	294	1001.7	------	78	55	66.7	-4.8	93	30	42	8	4	0	--	--	2.46	-1.53	.90	6	3	.0	0	----	---	--	---	--	11	8	12	5.6	--
Vicksburg CO	234	1005.8	------	77	59	68.2	-4.7	93	30	43	4	1	0	--	--	6.33	2.11	3.84	8	5	.0	0	7.9	---	27	SE	1	7	10	14	6.1	62
MISSOURI																																
Columbia	778	986.8	1015.3	71	48	59.9	-3.7	87	31	33	4	0	0	46	62	5.22	.38	1.59	11	6	.0	0	9.3	NW	34	NW	3	8	12	11	5.8	75
Kansas City	741	988.2	1015.4	72	52	61.8	-3.7	86	22	35	3	0	0	46	60	3.57	-.84	1.14	11	5	T	0	9.3	WNW	56	NW	18	8	10	13	5.9	57
St. Josepb	809	980.0	1015.1	70	49	59.5	-5.0	85	22	32	4	0	1	44	58	5.04	.97	1.16	10	7	.0	0	9.7	---	40	NW	2	10	9	12	5.7	67
St. Louis CO	465	994.9	------	71	53	62.0	-4.2	90	31	36	4	1	0	--	--	2.80	-1.30	.80	13	9	T	T	11.1	---	44	SW	31	9	12	10	5.6	63
St. Louis	552	994.9	1015.4	73	51	61.6	-3.8	91	31	33	4	1	0	46	60	2.50	-1.52	.51	14	6	.0	0	9.0	NW	--	---	--	8	13	10	5.6	--
Springfield	1265	967.8	1015.2	72	49	60.4	-3.2	85	31	32	4	0	1	49	69	6.12	1.10	2.51	10	6	.0	0	11.2	S8E	47	8W	31	6	10	15	6.4	68
MONTANA																																
Hillings	3568	889.9	1013.7	66	42	53.8	-2.2	91	19	14	2	1	3	37	57	1.90	.10	.44	12	3	3.4	6	10.6	NE	37	W	25	3	14	14	6.8	58
Glasgow CO	2090	940.4	1015.1	66	40	53.1	-3.2	93	19	17	3	2	4	35	56	2.48	.93	1.14	13	6	1.1	3	----	---	--	---	--	2	8	21	7.7	--
Great Falls	3664	887.2	1014.0	65	42	53.5	-.3	88	19	15	1	0	4	31	49	1.17	-.76	.36	10	3	.8	3	12.7	SW	45	8	25	4	11	16	7.1	63
Bavre CO	2488	925.8	1014.6	66	42	54.1	-1.6	84	19	14	2	0	3	--	--	1.10	-.38	.42	11	4	.6	1	9.3	---	32	SE	25	5	6	20	7.5	47
Helena	3893	872.3	1014.1	66	40	52.7	.4	90	19	17	2	1	5	34	52	1.17	-.43	.74	8	6	T	T	8.4	W	34	8W	25	4	11	16	7.0	72
Kalispell	2965	------	------	65	40	52.5	.1	82	18	19	1	0	6	--	--	1.05	-.58	.43	12	2	T	T	----	---	--	---	--	7	11	13	6.3	--
Miles City	2629	930.6	1014.7	67	41	54.1	-3.0	91	19	15	3	1	6	38	--	.82	-.89	.25	10	6	T	T	10.7	8E	--	---	--	4	11	16	7.2	--
Missoula	3200	900.8	1015.1	68	39	53.4	-.2	88	18	21	1	0	6	35	54	1.60	-.04	.57	11	4	T	T	6.7	W	57	SW	24	6	9	16	7.0	65
NEBRASKA																																
Grand Island	1841	948.9	1014.9	68	45	56.5	-4.6	87	22	26	3	0	5	42	63	2.74	-1.13	1.59	9	4	.9	1	11.4	S	--	---	--	8	6	17	6.4	--
Lincoln CO	1184	------	------	69	48	58.3	-4.2	89	22	30	3	0	1	--	--	4.22	1.12	1.64	11	7	.0	0	8.8	---	35	NW	2	7	11	13	6.4	64
Norfolk	1544	959.4	1015.2	68	44	55.8	-3.3	92	22	27	3	1	6	41	58	4.23	.60	1.73	10	9	.2	T	----	---	--	---	--	5	16	10	6.1	--
North Platte	2779	915.0	1013.7	67	43	54.5	-4.4	86	30	21	3	0	6	43	67	2.13	-.54	.92	9	4	2.1	1	12.2	8E	42	N	2	4	9	18	7.3	57
Omaba	978	975.6	1015.5	70	48	58.8	-3.9	89	22	32	4	0	1	43	61	3.32	.57	1.54	9	7	T	T	11.7	NW	44	N	31	9	12	10	5.9	72
Scottsbluff	3950	877.8	1012.9	69	43	55.9	-.3	92	20	24	3	2	4	40	61	2.73	.09	1.40	10	8	1.5	1	12.7	ESE	--	---	--	5	12	14	6.6	--
Valentine CO	2581	922.5	------	66	43	54.6	-2.8	91	21	20	3	2	5	--	--	1.26	-1.40	.45	9	5	4.4	4	9.7	---	30	NW	23	5	13	13	6.3	74
NEVADA																																
Elko	5075	842.5	1012.0	76	35	55.3	2.3	92	19	19	2	1	12	28	38	T	-.95	T	0	1	.0	0	6.5	NW	•39	WNW	29	13	7	11	5.2	--
Ely	6257	807.0	1011.8	73	35	54.0	2.3	87	19	17	1	0	10	24	37	.28	-.90	.23	4	2	T	1	11.2	---	52	S	°9	13	10	8	4.7	76
Las Vegas	2162	942.1	1006.1	93	62	77.8	3.7	102	20	46	2	25	0	27	16	.00	-.16	.00	0	0	.0	0	11.6	SW	•44	SSW	29	22	9	0	2.5	94
Reno	4397	860.1	1012.4	78	40	59.0	3.7	94	18	24	1	3	3	31	40	.02	-.46	.02	1	0	.0	0	6.8	WNW	42	SW	29	17	9	5	3.5	87
Winnemucca	4299	865.6	1011.9	78	38	58.1	2.2	96	19	18	2	3	8	27	32	.08	-.76	.08	1	0	T	T	8.4	---	38	N	26	12	12	7	4.6	87

See footnotes at end of table.

CLIMATOLOGICAL DATA

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
NEW HAMPSHIRE																																
Concord	339	1002.4	1013.2	65	43	53.7	-1.1	83	1	33	°27	0	0	43	71	8.26	5.22	2.19	18	3	0.0	0	6.6	NW	26	W	17	4	8	19	7.5	37
Mt. Washington	6262	802.8	1019.0	39	29	33.7	-1.6	55	1	10	27	0	24	--	93	7.18	1.86	1.92	22	1	12.0	6	26.5	W	105	WNW	11	3	6	22	8.2	27
NEW JERSEY																																
Atlantic City CO	8	1011.5	------	65	53	58.9	-.2	83	30	43	5	0	0	--	--	2.44	-.54	1.40	13	2	.0	0	----	---	42	E	7	5	9	17	7.1	52
Newark	11	1012.5	1013.5	68	51	59.6	-1.5	86	31	42	°7	0	0	45	63	3.66	-.07	1.11	13	4	T	T	10.2	NNE	30	NW	22	3	11	17	7.4	--
Trenton CO	56	1006.4	------	68	51	59.4	-2.4	85	31	41	7	0	0	--	--	3.26	-.22	1.76	12	1	T	T	----	---	24	N	23	3	9	19	7.4	49
NEW MEXICO																																
Albuquerque	5310	845.9	1008.1	81	53	67.0	1.7	90	°8	38	°1	2	0	34	34	.51	-.36	.20	11	3	T	0	9.8	SE	42	NW	10	17	9	5	3.9	79
Clayton	4969	843.9	1008.5	71	45	57.5	-2.4	87	30	24	3	0	3	--	--	5.59	3.00	4.67	7	4	1.0	1	----	---	--	---	--	14	7	10	4.9	--
Roswell	3612	890.3	1009.6	84	53	68.3	.2	95	30	36	°2	9	0	--	--	2.65	1.37	2.50	4	4	.0	0	11.7	---	52	W	1	15	11	5	3.7	--
NEW YORK																																
Albany	277	1009.5	1013.3	66	45	55.3	-2.2	81	29	32	13	0	1	44	67	5.40	2.60	1.92	11	4	.0	0	7.8	WNW	27	W	26	5	11	15	7.0	46
Binghamton	1601	988.5	1013.7	63	44	53.2	-1.7	78	°31	34	°7	0	0	40	65	3.61	-.26	1.56	14	3	T	0	10.1	WNW	54	W	29	4	8	19	7.5	60
Buffalo	693	986.8	1014.7	65	44	54.5	-.9	84	2	35	4	0	0	40	61	1.35	-1.12	.55	10	1	T	0	12.5	SW	38	SW	16	6	15	10	6.2	74
New York CO	10	1001.7	------	66	53	59.2	-1.6	82	31	42	5	0	0	--	--	3.30	-.21	1.13	11	3	.0	0	11.4	---	46	NW	22	3	15	13	6.7	52
New York	19	1011.9	1012.7	68	53	60.3	-1.0	85	31	45	°10	0	0	46	64	3.68	.35	1.27	11	3	.0	0	12.8	NE	47	NW	10	3	14	14	7.0	--
Rochester	543	994.9	1014.1	66	44	54.9	-1.5	85	1	35	9	0	0	43	66	1.59	-1.05	.71	9	3	T	0	8.4	WSW	34	W	25	5	13	13	6.1	66
Schenectady	217	------	------	66	47	56.4	-1.7	81	29	36	13	0	0	--	--	5.24	2.26	1.53	11	1	.0	0	----	---	--	---	--	14	10	7	4.5	--
Syracuse	424	992.9	1014.7	67	45	56.2	-1.5	85	29	35	°7	0	0	43	64	3.17	.27	2.56	13	2	.0	0	7.4	NW	35	NW	30	6	13	12	6.4	63
NORTH CAROLINA																																
Asheville CO	2203	------	------	70	47	58.5	-4.9	88	30	35	°11	0	0	--	--	2.78	-.25	1.21	10	3	.0	0	----	---	26	NW	4	11	8	12	5.4	66
Asheville	2093	------	1015.6	--	--	----	----	--	--	--	--	--	--	48	75	----	----	----	--	--	---	--	4.2	NNW	--	---	--	--	--	--	---	--
Charlotte	753	987.5	1015.0	75	53	64.0	-4.3	89	30	41	10	0	0	51	67	2.52	-.46	.91	9	5	T	0	6.0	N	34	NW	3	8	9	14	6.3	71
Greensboro	891	983.7	1015.4	73	50	61.7	-4.6	87	31	35	11	0	0	50	70	2.62	-1.02	.74	10	2	.0	0	8.0	SW	33	WNW	3	9	8	14	6.0	61
Hatteras	4	1013.9	1014.5	73	62	67.5	-.7	80	°31	49	6	0	0	58	73	3.54	-.39	2.10	9	4	.0	0	11.8	SSW	43	NE	14	8	7	16	6.2	54
Raleigh	438	999.3	1015.1	75	52	63.3	-4.0	87	°29	35	11	0	0	52	71	3.65	.15	1.01	11	5	.0	0	6.8	SW	--	---	--	9	11	11	5.7	--
Wilmington	30	1015.2	------	77	57	67.1	-2.9	90	30	43	11	1	0	--	--	5.73	2.30	2.48	9	4	.0	0	----	---	46	NE	13	10	10	11	5.6	68
Winston-Salem	967	980.4	1015.3	74	52	62.8	-3.9	89	31	39	5	0	0	56	64	5.35	1.42	1.64	11	4	.0	0	8.5	NNW	*30	WNW	3	10	7	14	5.6	--
NORTH DAKOTA																																
Bismarck	1650	955.0	1015.5	65	38	51.8	-3.0	89	20	20	4	0	9	35	57	2.01	.07	1.04	6	2	T	T	12.8	NNW	49	N	30	3	14	14	6.8	64
Devils Lake CO	1471	962.1	------	60	37	48.7	-4.3	86	20	24	3	0	12	--	--	3.17	1.04	.92	9	3	2.1	2	10.6	---	34	W	15	7	11	13	6.1	63
Fargo	895	980.4	1015.1	62	39	50.4	-4.6	83	21	24	3	0	13	36	61	.81	-1.36	.36	9	4	.9	1	17.6	NNW	50	N	3	8	10	13	6.0	61
Williston CO	1877	947.5	1015.5	62	40	51.2	-3.4	85	20	19	°2	0	7	35	57	.73	-.93	.29	12	2	.3	2	8.7	---	30	SE	26	4	8	19	7.3	62
OHIO																																
Akron	1210	977.3	1015.7	66	44	54.9	-3.6	86	31	30	4	0	2	42	66	1.52	-2.23	.68	10	4	T	0	8.6	NW	--	---	--	3	12	16	6.8	--
Cincinnati Obs.	761	------	------	71	49	59.8	-3.8	90	31	33	4	1	0	--	--	1.62	-1.92	.35	10	3	T	0	5.4	---	23	SW	2	--	--	--	---	57
Cincinnati	869	983.7	1015.5	70	48	58.8	-3.7	89	31	31	4	0	1	44	61	1.33	-2.12	.40	9	2	.0	0	8.5	SSW	*35	WSW	2	2	12	17	7.3	--
Cleveland CO	663	------	------	64	49	56.8	-2.3	86	31	34	4	0	0	--	--	1.84	-1.18	1.11	7	--	.0	0	----	---	--	---	--	--	--	--	---	--
Cleveland	787	987.5	1015.0	68	47	57.4	-1.7	86	31	33	4	0	0	43	62	1.04	-1.69	.29	9	1	T	0	9.6	S	29	SW	1	3	14	14	6.7	60
Columbus CO	724	------	------	68	52	59.5	-2.7	89	31	36	°10	0	0	--	--	2.18	-1.05	.51	13	--	T	0	----	---	--	---	--	--	--	--	---	--
Columbus	815	985.4	1015.5	69	46	57.7	-3.1	91	31	31	8	1	1	45	66	2.56	-1.41	.67	13	4	T	T	7.5	NNW	30	NW	3	6	9	16	6.8	62
Dayton	1002	979.0	1015.2	67	47	57.1	-3.9	87	31	32	4	0	1	45	66	2.32	-1.22	.97	15	8	T	T	8.6	WNW	56	S	2	4	10	17	7.2	62
Portsmouth CO	715	------	------	72	47	59.1	-3.7	92	31	34	°8	1	0	--	--	2.43	-1.31	1.13	12	4	T	T	4.5	---	45	W	9	--	--	--	---	--
Sandusky	603	993.2	------	65	49	57.4	-1.9	91	31	34	4	1	0	--	--	1.14	-2.18	.46	9	5	T	T	7.5	---	24	W	3	7	12	12	5.8	65
Toledo	622	991.5	1014.9	66	45	55.4	-2.8	90	31	30	8	1	2	43	65	1.66	-1.29	.69	10	5	T	0	11.1	ENE	37	NW	31	3	13	15	6.8	57
Youngstown	1178	972.6	1015.3	66	43	54.7	-3.6	85	31	31	°5	0	2	41	63	1.38	-2.71	.48	8	3	T	T	9.0	WSW	*27	WSW	1	3	13	15	7.0	--
OKLAHOMA																																
Oklahoma City	1280	970.9	1014.4	72	54	63.0	-5.0	87	30	32	3	0	1	53	73	6.21	1.96	1.63	11	9	T	0	13.2	SSE	40	N	3	7	8	16	6.6	56
Tulsa	672	990.2	1014.5	75	54	64.4	-3.8	87	30	36	°3	0	0	53	68	5.17	.40	1.69	14	7	T	0	10.3	S	34	NE	2	7	10	14	6.4	55
OREGON																																
Astoria	12	1017.3	1018.2	61	44	52.3	-1.2	77	17	30	1	0	1	45	78	1.66	-1.71	.43	13	0	.0	0	6.8	NW	--	---	--	3	8	20	7.6	--
Burns CO	4140	871.3	1013.1	71	40	55.7	1.6	93	18	19	1	1	4	30	42	.55	-.20	.33	4	0	T	0	----	---	--	---	--	12	8	11	5.4	--
Eugene	361	1003.4	1017.0	68	42	54.9	-1.5	84	17	28	1	0	1	44	69	.59	-1.40	.31	7	0	.0	0	8.2	N	*27	W	26	6	11	14	6.7	--
Meacham	4050	------	------	62	38	49.7	1.7	84	18	20	1	0	8	--	--	1.24	-1.13	.30	9	3	3.9	T	----	---	--	---	--	7	9	15	6.6	--
Medford	1312	967.8	1015.1	77	45	60.8	2.1	94	17	28	1	3	1	42	55	.33	-.89	.16	5	0	.0	0	4.1	WNW	*20	NNW	29	10	8	13	5.5	--
Pendleton	1489	961.1	1014.3	72	46	59.1	-.7	93	18	25	1	1	1	35	44	.67	-.30	.26	6	1	T	T	10.0	W	--	---	--	8	11	12	5.7	--
Portland	22	1010.8	1016.4	67	46	56.7	-.9	86	17	29	1	0	1	45	69	1.83	.07	.58	11	2	.0	0	5.9	NW	26	NW	31	2	9	20	7.6	58
Roseburg	505	998.0	1016.9	71	42	56.3	----	90	17	26	1	1	2	--	--	.30	-1.43	.14	5	0	.0	0	5.5	---	20	N	5	8	8	15	6.3	55
Salem	195	1009.5	1016.7	70	42	55.6	-1.6	87	17	25	1	0	1	43	66	1.34	-.59	.55	8	1	T	T	6.4	S	--	---	--	3	12	16	7.1	--
Sexton Summit CO	3836	------	------	64	41	52.7	2.2	83	17	29	1	0	3	--	--	.25	-1.70	.13	5	0	T	T	----	---	--	---	--	12	6	13	5.7	--
PENNSYLVANIA																																
Allentown	376	1000.0	1014.2	68	47	57.5	-3.0	83	29	33	7	0	0	46	69	3.67	-.30	1.13	13	6	.0	0	8.9	SW	--	---	--	2	12	17	7.4	--
Harrisburg	335	1000.7	1014.4	70	49	59.6	-2.8	87	2	38	5	0	0	44	60	3.28	-.42	1.14	13	4	.0	0	7.9	WNW	27	NW	10	3	10	18	7.5	51
Park Place CO	1932	------	------	64	44	53.8	-2.0	80	3	32	°11	0	2	--	--	4.60	.03	1.32	15	0	.9	1	----	---	--	---	--	4	13	14	6.9	--
Philadelphia CO	26	------	------	69	54	61.6	-2.1	83	31	42	10	0	0	--	--	2.64	-.94	1.08	13	3	.0	0	7.7	S	23	NW	21	3	12	16	7.4	56
Philadelphia	13	1009.5	1013.7	70	52	61.2	-1.9	86	31	40	10	0	0	47	63	2.40	-1.18	.83	12	3	.0	0	9.3	WSW	*32	WNW	11	3	9	19	7.5	--
Pittsburgh CO	749	------	------	69	49	59.4	-3.2	87	31	38	4	0	0	--	--	2.65	-.84	.81	12	--	T	0	----	---	--	---	--	--	--	--	---	49
Pittsburgh	1151	984.8	1015.0	67	46	56.2	-3.6	86	31	33	°5	0	0	41	60	1.88	-1.89	.83	9	4	T	0	9.7	WSW	*32	SW	28	2	13	16	7.1	68
Reading CO	266	1002.0	------	70	51	60.3	-2.2	85	31	37	10	0	0	--	--	3.16	-.53	1.28	13	5	.0	0	9.7	---	42	E	3	3	9	19	7.5	38
Scranton CO	746	984.4	------	68	47	57.4	-2.0	84	29	34	°10	0	0	--	--	3.93	.36	1.25	13	3	T	0	6.0	---	21	NW	25	5	9	17	6.8	53
Williamsport	527	994.9	1013.9	70	46	58.2	-2.0	84	2	34	11	0	0	43	61	4.61	.30	2.88	13	6	.0	0	7.3	W	*50	WSW	29	3	10	18	7.4	--
RHODE ISLAND																																
Block Island	110	1008.8	1013.1	60	48	53.6	.6	74	30	40	14	0	0	--	--	4.63	1.67	1.96	10	2	.0	0	----	---	--	---	--	3	12	16	7.4	--
Providence	55	1007.1	1013.2	64	47	55.6	-1.2	82	31	39	14	0	0	45	72	5.92	2.90	3.10	13	2	.0	0	11.6	NE	28	SW	28	4	11	16	7.3	40
SOUTH CAROLINA																																
Charleston CO	9	1012.5	------	77	63	69.9	-3.0	85	30	53	21	0	0	--	--	4.13	.77	1.29	9	5	.0	0	9.2	---	35	E	13	9	10	12	6.0	72
Charleston	41	1012.9	1014.6	79	57	67.9	-3.5	88	30	45	9	0	0	60	77	3.18	-.58	1.76	9	3	.0	0	8.2	SW	--	---	--	5	14	12	6.6	--
Columbia CO	332	1001.7	------	79	57	67.8	-4.0	92	30	47	11	1	0	--	--	2.82	-.48	1.28	12	--	.0	0	----	---	--	---	--	10	12	9	5.7	--
Columbia	217	1006.1	1014.2	80	53	66.5	-5.2	94	30	41	11	3	0	54	68	2.20	-1.03	1.26	8	4	.0	0	6.0	SSW	--	---	--	11	10	10	5.6	71
Florence	146	1009.1	1014.6	79	56	67.4	-3.9	93	30	45	11	2	0	--	--	4.35	.57	1.57	10	5	.0	0	----	---	--	---	--	9	9	13	5.9	--
Greenville	1018	974.3	1014.6	76	54	64.7	-3.8	90	30	42	6	1	0	48	61	2.90	-.49	.89	7	4	T	T	8.6	NE	39	W	9	9	9	13	6.0	70
Spartanburg	801	------	------	75	54	64.6	-4.2	89	30	45	°11	0	0	--	--	2.36	-1.09	.75	6	4	T	T	----	---	--	---	--	10	12	9	5.4	--
SOUTH DAKOTA																																
Huron	1282	967.5	1015.0	66	39	52.4	-5.6	91	22	24	°4	1	11	38	62	2.21	-.04	1.20	8	3	1.6	1	12.1	SSE	49	NW	24	8	10	13	6.0	70
Rapid City	3165	900.4	1014.5	67	42	54.2	-.5	92	21	19	3	2	4	39	59	2.68	-.37	1.46	13	7	2.2	T	12.2	NNW	40	NW	22	3	16	12	6.9	49
Sioux Falls	1420	963.4	1015.2	66	40	52.7	-5.4	89	22	23	5	0	10	36	57	1.84	-1.54	.86	9	5	.2	T	12.4	N	*40	SSW	31	8	14	9	5.8	--
TENNESSEE																																
Bristol	1519	961.7	------	71	48	59.7	-4.5	90	31	33	5	1	0	--	--	2.62	-.82	.65	15	5	.0	0	----	---	--	---	--	6	10	15	6.4	--
Chattanooga	670	988.2	1015.7	75	51	63.2	-4.5	93	31	38	6	2	0	52	71	3.79	-.37	1.93	7	4	.0	0	4.3	NNE	46	NW	19	7	10	14	6.2	65
Knoxville	950	980.7	1015.9	73	51	62.3	-5.1	90	31	37	5	1	0	49	65	3.55	-.03	1.25	10	2	.0	0	6.6	ENE	33	SW	7	7	13	11	5.9	56

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F	°F	°F.	°F.	°F.		°F.		#		°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
TENNESSEE (Cont.)																																
Memphis CO	271	------	------	74	58	66.3	-4.2	90	°31	41	4	2	0	--	--	3.62	-0.03	1.57	10	--	0.0	0	----	---	--	---	--	--	--	--	---	--
Memphis	263	1000.7	1015.4	76	56	66.0	-4.1	91	°31	40	4	2	0	53	66	4.31	.39	1.45	10	4	.0	0	9.0	S	34	SE	1	8	9	14	6.4	64
Nashville	577	995.9	1015.9	74	51	62.9	-5.3	93	31	36	4	1	0	53	72	3.80	.02	1.69	12	3	.0	0	6.1	S	40	NW	2	5	14	12	6.3	47
Oak Ridge	905	982.4	------	73	49	60.9	-5.7	91	31	34	5	1	0	--	--	3.09	-1.09	1.11	9	6	T	T	4.1	---	20	W	9	9	10	12	5.7	--
TEXAS																																
Abilene	1759	951.6	1011.8	79	57	68.2	-3.5	95	31	38	3	3	0	55	67	4.61	.93	1.81	8	6	.0	0	14.3	SSE	61	NW	6	16	7	8	4.6	78
Amarillo	3590	887.6	1011.9	73	49	61.1	-2.7	89	°27	28	3	0	2	48	70	4.44	1.43	.92	13	10	T	0	15.5	S	53	SE	10	8	9	14	6.0	57
Austin	615	991.5	1013.2	84	63	73.4	-1.8	94	28	43	4	5	0	60	68	2.86	-1.51	1.68	4	3	T	0	10.5	SSE	29	S	°1	8	12	11	5.2	65
Brownsville	16	1009.5	1011.8	86	69	77.7	-1.2	94	°2	53	4	8	0	67	73	.26	-3.10	.25	2	2	.0	0	14.1	ESE	37	E	19	11	17	3	4.6	80
Corpus Christi	40	1011.9	1012.8	84	67	75.7	-.9	91	°28	50	4	3	0	67	78	.92	-2.49	.44	6	3	.0	0	13.0	SE	34	N	3	10	13	8	5.3	77
Dallas	487	995.6	1014.0	80	60	69.9	-3.8	96	28	39	4	4	0	58	69	4.98	.01	2.70	8	4	.0	0	9.9	SE	38	W	2	7	14	10	5.4	55
Del Rio	1091	977.3	1011.0	87	65	76.1	-1.3	96	27	47	4	14	0	59	61	1.98	-.49	.96	4	5	.0	0	9.5	ESE	34	N	2	11	12	8	4.8	64
El Paso	3920	882.8	1007.9	86	60	73.2	1.6	94	15	43	2	13	0	36	29	1.26	.85	1.04	5	5	T	T	11.7	W	61	S	17	21	9	1	2.6	94
Fort Worth	544	993.6	1014.0	79	59	68.8	-4.5	95	28	41	°3	3	0	57	70	4.38	-.54	2.66	6	5	.0	0	13.8	S	*44	E	11	8	12	11	5.6	--
Galveston CO	7	------	------	78	70	73.8	-1.9	84	31	52	4	0	0	--	--	1.21	-1.99	.97	3	--	.0	0	12.8	---	35	N	3	--	--	--	---	70
Galveston	5	1011.9	1014.2	79	69	73.9	-2.0	85	°29	52	4	0	0	65	75	1.68	-1.81	1.27	2	3	.0	0	11.8	S	--	---	--	11	14	6	4.6	--
Houston CO	41	1008.8	------	82	65	73.5	-2.4	90	29	46	4	2	0	--	--	2.97	-1.87	1.65	6	4	.0	0	10.2	---	33	SE	11	9	13	9	4.9	85
Houston	50	1010.8	1013.6	82	63	72.4	-2.3	91	28	46	4	1	0	62	73	2.70	-2.21	2.20	8	4	.0	0	10.9	SSE	--	---	--	8	14	9	5.4	--
Laredo	500	990.5	1010.8	91	68	79.6	-1.6	104	1	53	4	20	0	64	63	3.28	.10	1.27	7	6	.0	0	16.1	SE	*32	SE	10	11	18	2	4.6	--
Lubbock	3243	900.8	1011.3	76	51	63.6	-4.2	92	27	33	3	1	0	50	67	4.45	1.09	2.05	7	9	T	0	15.8	SE	*40	N	1	10	12	9	5.1	--
Midland	2854	912.6	1010.7	81	57	69.0	-4.3	94	31	39	3	5	0	49	56	4.11	2.04	1.72	11	11	.0	0	8.6	SE	*25	NE	7	15	9	7	4.1	--
Port Arthur	16	1012.9	1014.0	82	62	72.1	-2.3	90	29	46	4	1	0	63	76	8.55	4.15	7.18	3	2	.0	0	11.0	S	40	SE	°1	10	12	9	5.3	80
San Angelo	1903	945.5	1011.4	82	59	70.9	-2.7	97	27	41	3	4	0	55	78	4.14	1.18	1.83	8	9	T	T	----	---	--	---	--	12	13	6	4.5	--
San Antonio	792	987.8	1012.3	85	65	74.9	-1.1	94	28	44	4	9	0	60	64	1.46	-2.06	.92	4	3	.0	0	10.0	SSE	34	NE	2	12	11	8	4.8	74
Victoria	110	1008.1	1012.8	84	65	74.3	-3.1	92	°20	45	4	6	0	63	69	1.69	-2.33	.80	5	3	.0	0	11.8	---	†42	NNW	3	14	8	9	5.0	--
Waco	500	994.6	1013.1	81	62	71.3	-3.2	93	28	43	4	4	0	60	72	3.87	-.28	1.88	9	5	.0	0	10.9	S	--	---	--	10	11	10	5.5	--
Wichita Falls	1027	976.6	1013.2	76	56	65.9	-4.6	90	31	36	3	1	0	55	71	7.79	3.93	3.32	12	12	T	0	9.6	SE	*32	NW	1	11	7	13	5.3	--
UTAH																																
Milford	5028	843.6	1010.9	78	41	59.4	2.6	91	°19	24	2	2	4	--	--	1.10	.36	.91	3	2	1.8	3	----	---	--	---	--	11	13	7	4.8	--
Salt Lake City	4222	864.5	1010.6	76	47	61.5	2.6	91	°19	29	2	2	3	35	42	.63	-.93	.48	4	4	T	T	10.2	SE	40	SW	20	12	8	11	5.1	76
VERMONT																																
Burlington	331	998.3	1012.9	64	45	54.6	-.8	80	31	32	6	0	1	44	71	3.30	.41	.99	12	0	.0	0	9.0	N	27	S	28	5	10	16	7.1	47
VIRGINIA																																
Lynchburg	947	981.4	1014.9	71	50	60.8	-4.2	89	2	37	11	0	0	49	67	3.40	.31	.99	11	4	.0	0	8.2	SSW	27	SW	3	6	12	13	6.5	63
Norfolk	26	1013.5	1014.7	73	55	64.0	-1.9	88	3	42	11	0	0	54	72	5.78	2.33	1.56	13	2	.0	0	8.3	SW	35	NE	14	9	9	13	6.1	50
Richmond	162	1008.8	1014.8	74	52	63.0	-2.8	91	3	37	11	2	0	52	71	4.36	+.72	1.51	15	4	.0	0	7.8	W	31	NW	17	4	15	12	6.5	64
Roanoke	1174	973.2	1015.2	72	49	60.7	-4.0	91	2	35	5	1	0	46	63	3.42	-.20	1.07	9	5	T	T	8.1	NW	--	---	--	6	11	14	8.6	--
WASHINGTON																																
Olympia	190	1009.5	1016.8	66	40	52.9	-1.2	79	°7	25	1	0	2	40	65	1.63	-.03	.77	9	0	T	0	6.7	SSW	*30	WSW	31	2	13	16	7.4	--
Seattle CO	14	------	------	65	49	56.8	-.5	78	18	35	1	0	0	--	--	1.57	-.04	.68	8	1	.0	0	8.9	---	34	S	11	3	11	17	7.5	52
Seattle-Tacoma	379	1002.7	1017.1	64	44	53.9	-1.2	75	°17	28	1	0	1	43	70	1.89	.25	.68	10	1	.0	0	10.7	SW	--	---	--	3	9	19	7.5	--
Spokane	2357	945.1	1014.0	68	43	55.4	.7	89	18	24	1	0	2	36	52	.78	-.26	.24	8	0	.0	0	7.6	NE	34	SW	11	4	10	17	7.1	58
Stampede Pass CO	3958	879.1	1018.2	50	35	42.4	-2.1	73	17	20	1	0	13	--	--	3.02	-1.72	.89	14	0	8.9	130	----	---	--	---	--	4	6	21	7.8	--
Tatoosh CO	101	1014.2	1017.5	54	46	49.9	-1.0	59	7	39	1	0	0	45	84	.87	-2.44	.53	10	0	.0	0	10.1	W	38	E	7	1	8	22	8.4	45
Walla Walla CO	949	978.3	1014.2	73	50	61.4	.2	93	18	28	1	1	1	--	--	.81	-.45	.22	7	1	T	T	6.0	---	29	W	11	8	12	11	5.6	66
Walla Walla	1200	------	------	--	--	----	----	--	--	--	--	--	--	40	--	----	-----	----	--	--	---	---	8.2	S	--	---	--	--	--	--	---	--
Yakima	1061	975.6	1014.5	74	42	57.7	-1.4	94	18	25	1	1	3	35	45	.36	.11	.16	4	2	.0	0	9.6	WNW	--	---	--	8	12	11	5.8	--
WEST VIRGINIA																																
Charleston	950	980.0	1015.3	71	49	59.7	-4.0	91	31	37	°22	1	0	48	70	2.67	-1.11	1.10	15	5	T	0	6.9	SW	*36	WNW	°9	2	11	18	7.8	--
Elkins	1970	946.5	1015.8	66	42	53.9	-4.3	85	31	32	9	0	1	45	--	2.21	-2.04	.62	16	5	1.0	1	4.4	NW	31	SW	3	2	8	21	7.8	44
Huntington CO	565	------	------	73	49	61.2	-4.5	94	31	36	4	1	0	--	--	2.54	-1.28	.82	11	--	.0	0	----	---	--	---	--	--	--	--	---	--
Parkersburg CO	615	------	------	71	49	60.2	-3.3	91	31	37	5	1	0	--	--	3.13	-.37	1.14	12	4	.0	0	5.4	---	26	W	2	5	8	18	7.1	59
Parkersburg	837	------	------	--	--	----	----	--	--	--	--	--	--	47	--	----	-----	----	--	--	---	---	6.3	WSW	--	---	--	--	--	--	---	--
WISCONSIN																																
Green Bay	689	991.5	1014.5	61	39	49.7	-4.7	80	31	27	°4	0	8	38	65	3.22	.69	2.14	10	1	1.1	T	9.7	NW	49	SW	1	5	11	15	6.8	54
La Crosse	652	989.2	1014.3	64	44	53.9	-5.1	83	23	28	3	0	2	40	62	2.03	-1.24	.79	11	6	T	0	12.6	NW	*40	NNW	4	5	11	15	6.9	--
Madison	857	979.0	1014.6	65	42	53.2	-4.3	83	31	28	7	0	5	39	62	2.98	-.29	1.35	10	5	T	0	11.5	WNW	44	W	3	7	9	15	6.8	57
Milwaukee	675	989.8	1014.9	61	43	51.7	-2.6	85	31	30	4	0	3	39	65	1.83	-1.15	.57	9	4	T	T	11.6	NNE	44	SW	31	6	13	12	6.1	64
WYOMING																																
Casper	5322	835.1	1011.2	67	40	53.2	.1	89	20	17	3	0	4	35	57	.70	-1.62	.22	8	3	.9	T	11.7	SW	--	---	--	5	13	13	6.9	--
Cheyenne	6139	810.4	1013.1	63	38	50.7	.6	89	20	17	2	0	5	36	63	1.45	-1.01	.51	10	8	2.0	4	10.1	SSE	40	NW	27	5	12	14	6.6	59
Lander	5563	833.7	1012.9	67	40	53.2	.8	91	20	18	°1	1	6	34	53	.64	-1.93	.35	7	3	2.1	14	7.5	---	50	SW	25	7	13	11	6.1	71
Sheridan	3942	882.8	1014.1	66	39	52.4	-.5	89	19	13	3	0	4	38	61	1.58	-1.06	.64	14	4	6.3	5	10.2	NW	41	NW	27	6	9	16	6.7	62
PACIFIC AREA																																
Canton Island	9	1008.8	1009.1	90	79	84.5	.3	93	°4	75	2	22	0	74	76	.35	-2.51	.21	4	0	.0	0	----	---	--	---	--	7	17	7	5.4	--
Hilo	31	1013.9	1015.5	79	66	72.8	-.3	85	20	62	8	0	0	67	83	9.72	.72	1.39	29	1	.0	0	6.5	N	*23	N	13	0	3	28	9.3	28
Honolulu	7	1015.9	1016.5	81	69	75.0	-1.1	84	°12	64	7	0	0	69	63	.16	-.24	.13	4	0	.0	0	11.7	ENE	30	NE	28	1	15	15	7.6	63
Koror CO	94	1005.1	1009.1	88	75	81.6	.3	91	1	73	7	12	0	76	86	27.46	13.31	5.56	28	5	.0	0	3.6	---	22	SE	°4	1	6	24	8.5	--
Lihue	115	1011.9	1017.0	79	67	72.8	-1.3	82	25	59	10	0	0	65	76	2.75	.24	.60	18	0	.0	0	12.5	NE	28	NE	19	1	3	27	8.8	34
Ponape CO	112	1005.1	1010.3	87	75	81.0	-.5	91	1	70	18	3	0	76	86	21.76	2.10	4.78	27	4	.0	0	----	---	--	---	--	--	--	--	---	--
Truk (Moen Island)	8	1009.5	1009.8	85	77	81.0	.1	87	°4	73	6	0	0	77	86	22.47	9.57	3.41	26	4	.0	0	----	---	--	---	--	0	2	29	9.3	--
Wake Island	11	1015.2	1015.6	82	75	78.5	-.9	85	°24	70	14	0	0	72	79	1.53	-.78	.30	17	0	.0	0	19.0	ENE	--	---	--	5	20	6	5.7	--
Yap CO	53	1007.5	1009.3	87	77	81.7	-.6	89	14	74	°5	0	0	76	84	12.94	3.79	3.44	21	1	.0	0	----	---	--	---	--	0	8	23	8.6	--
WEST INDIES																																
San Juan CO	47	------	------	84	73	78.5	-.2	92	9	68	3	2	0	--	--	3.70	-2.81	1.59	18	5	.0	0	----	---	--	---	--	--	--	--	---	--
San Juan, P. R.	9	1012.5	1014.7	86	73	79.4	.3	92	9	68	3	4	0	72	79	4.76	-2.73	1.63	17	7	.0	0	9.7	SSE	26	E	°26	6	20	5	5.5	69
ALASKA																																
Anchorage	92	1008.5	1013.8	57	40	48.4	2.7	68	°19	31	2	0	1	36	62	.15	-.36	.05	4	0	.0	0	6.9	S	*23	S	27	6	4	21	7.3	61
Annette Island	110	1012.9	1017.0	55	43	48.8	-.2	71	8	32	1	1	1	42	80	5.00	.51	1.19	17	0	.0	0	9.5	SSE	*29	SE	3	2	4	25	8.6	--
Barrow	22	1023.4	1024.0	22	10	16.3	-2.5	33	°1	-4	6	0	31	14	87	.12	-.01	.10	4	0	1.2	12	10.2	---	24	NE	6	3	4	24	8.4	--
Bethel	21	1009.5	1010.6	57	35	45.9	5.9	68	23	27	1	0	7	36	69	.02	-.87	.01	2	0	.0	T	11.0	ESE	*33	ESE	7	4	10	17	7.1	--
Cordova	40	1013.5	1015.2	53	35	44.1	1.2	67	10	28	15	0	8	38	78	2.49	-3.95	1.15	15	0	.0	T	4.2	E	*20	E	°6	3	4	24	8.3	--
Fairbanks	436	995.3	1012.2	64	37	50.5	3.1	76	31	27	°12	7	11	30	46	.17	-.57	.13	3	0	.0	0	6.4	N	26	NE	11	8	15	8	5.3	--
Juneau	15	1015.2	1016.2	55	38	46.3	-.7	68	30	26	1	0	5	39	77	2.98	-.21	.61	17	0	.0	0	6.0	E	25	E	9	2	5	24	8.5	32
Kotzebue	10	1013.9	1014.6	44	30	36.8	7.2	57	30	22	17	0	22	30	78	.03	-.30	.03	1	0	.1	8	13.3	E	*30	E	6	6	13	12	6.1	--
McGrath	334	998.6	1011.5	62	38	49.5	6.3	69	°17	26	2	0	3	34	56	.34	-.60	.29	4	2	.0	0	5.5	E	*18	ENE	7	4	10	17	7.2	--
Nome	13	1011.9	1012.7	47	33	40.4	6.7	65	24	24	17	0	14	32	72	.22	-.37	.09	7	0	T	4	10.6	WSW	29	E	7	12	8	11	5.4	64
Northway	1713	949.5	1012.9	57	33	45.0	+.2	72	31	20	13	1	17	31	58	1.52	.80	.56	5	1	T	T	6.6	NW	*21	SW	°6	1	12	18	7.6	--
St. Paul Island	22	1004.4	1005.7	39	31	35.1	-.1	45	31	25	17	0	21	33	93	1.94	.76	.44	16	0	2.3	1	----	---	--	---	--	0	4	27	9.1	--
Yakutat	28	1014.9	1016.2	51	36	43.8	+.5	65	31	28	10	0	8	39	85	3.38	-4.54	1.72	17	0	.0	1	6.9	ESE	*26	SE	31	3	5	23	8.4	--

Data from airport unless otherwise specified. CO indicates data from city office.

* Data entered in column "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.

° Other dates also.

† Peak gust.

# Max. 70°F. or above for Alaskan Stations.

‡ Maximum hourly average.

HEATING DEGREE DAYS

(Base 65°F.)

State and station	Current season		Normals
	This month	Period July through this month	July through this month
ALABAMA			
Birmingham	95	2638	2780
Mobile	13	1564	1612
Montgomery (CO)	33	1898	1954
Montgomery	36	2061	2137
ARIZONA			
Flagstaff	363	6760	7313
Phoenix (CO)	2	1113	1492
Phoenix	4	1365	1698
Prescott	68	3981	4516
Tucson	6	1350	1776
Winslow	48	4322	4694
Yuma	0	743	951
ARKANSAS			
Ft. Smith	101	3181	3188
Little Rock	68	2800	2982
Texarkana	67	2355	2362
CALIFORNIA			
Bakersfield	8	2096	2115
Bishop	34	3867	4184
Blue Canyon	277	4968	5517
Burbank	46	1407	1786
Eureka (CO)	411	4250	4350
Fresno	15	2502	2532
Los Angeles (CO)	47	1102	1432
Los Angeles	100	1516	1959
Mt. Shasta (CO)	271	5209	5739
Oakland	180	2704	3044
Red Bluff	13	2420	2546
Sacramento (CO)	27	2387	2595
Sacramento	33	2620	2815
Sandberg (CO)	146	3887	4187
San Diego	57	1160	1531
San Francisco (CO)	264	2751	2889
San Francisco	251	3012	3257
San Jose	97	2183	2364
Santa Maria	218	2602	2782
COLORADO			
Alamosa	368	7805	8456
Colorado Springs	335	5526	6179
Denver	256	5032	6067
Grand Junction	97	4930	5773
Pueblo	194	4690	5682
CONNECTICUT			
Bridgeport	250	5045	5858
Hartford	251	5449	6108
New Haven	298	5427	5974
DELAWARE			
Wilmington	163	4566	4904
DIST. OF COLUMBIA			
Washington (CO)	132	3777	4258
Washington	143	3866	4333
FLORIDA			
Apalachicola (CO)	1	1164	1307
Daytona Beach	0	730	868
Fort Myers	0	360	405
Jacksonville (CO)	1	989	1113
Jacksonville	0	1117	1243
Key West (CO)	0	39	77
Miami (CO)	0	163	173
Int. Airport, Hialeah	0	144	178
Miami Beach	0	80	123
Orlando	0	612	650
Pensacola (CO)	11	1350	1435
Tallahassee	2	1380	1519
Tampa	0	530	674
West Palm Beach	0	220	248
GEORGIA			
Albany	14	1620	1763
Athens	91	2708	2800
Atlanta	105	2690	2826
Augusta	65	2356	2138
Columbus	58	2237	2396
Macon	48	2032	2049
Rome	141	3192	3138
Savannah	23	1716	1710
Valdosta	9	1418	1525
IDAHO			
Boise	203	5132	5798
Lewiston	204	4958	5415
Pocatello	249	5974	6840
ILLINOIS			
Cairo (CO)	103	3494	3756
Chicago (CO)	305	5271	
Chicago	275	5365	6252
Chicago University	331	5374	
Moline	291	5779	6319
Peoria	247	5378	6046
Springfield	219	4981	5661
INDIANA			
Evansville	189	4225	4354
Ft. Wayne	299	5543	6234
Indianapolis (CO)	217	4673	5118
Indianapolis	250	5012	5581
South Bend	349	5883	6462
Terre Haute	235	4895	5342
IOWA			
Burlington	261	5491	6067
Des Moines	274	5842	6401
Dubuque	354	6562	7195
Keokuk (CO)	180		
Sioux City	284	6275	6958
KANSAS			
Concordia (CO)	201	4744	5303
Dodge City	221	4551	5043
Goodland	323	5620	6309
Topeka (CO)	165	4365	4906
Topeka	188	4538	5194
Wichita	156	4156	4564
KENTUCKY			
Lexington	213	4257	4964
Louisville (CO)	163	3829	4279
Louisville	188	4099	4434
Pikeville (CO)	137	3660	
LOUISIANA			
Baton Rouge	23	1492	1595
Lake Charles	17	1357	1543
New Orleans (CO)	8	1087	1175
New Orleans	4	1162	
Int.Airport,Moisant	8	1312	1317
Shreveport	47	2056	2117
MAINE			
Caribou	497	9076	9972
Greenville (CO)	489	8457	
Portland	419	7015	7564
MARYLAND			
Baltimore (CO)	112	3636	4203
Baltimore	175	4422	4611
Frederick	226	4931	4854
MASSACHUSETTS			
Blue Hill Obs.	390	5942	
Boston	287	5206	5749
Nantucket	398	5371	5963
Pittsfield	398	6998	7589
MICHIGAN			
Alpena (CO)	498	7328	7938
Detroit	327	5755	6344
Escanaba (CO)	562	7700	8491
Grand Rapids (CO)	322	5841	6416
Grand Rapids	363	6246	6996
Lansing	380	6400	6912
Marquette (CO)	631	7731	8340
Muskegon	386	6279	6973
Sault Ste. Marie	612	8610	9251
MINNESOTA			
Duluth (CO)	649	8669	9374
Duluth	637	9255	9759
International Falls	616	10107	10429
Minneapolis	369	7198	7773
Rochester	415	7360	8003
St. Cloud	454	8360	8787
MISSISSIPPI			
Jackson	70	2151	2202
Meridian	77	2303	2333
Vicksburg (CO)	59	1957	2000
MISSOURI			
Columbia	189	4436	5099
Kansas City	153	4260	4880
St. Joseph	204	4869	5322
St. Louis (CO)	156	3920	4462
St. Louis	172	4163	4688
Springfield	183	4130	4677
MONTANA			
Billings	356	6400	6987
Glasgow (CO)	378	7906	8577
Great Falls	363	6922	7389
Havre (CO)	341	7554	8088
Helena	386	7169	8053
Kalispell	379	7442	7840
Miles City	352	7017	7716
Missoula	354	6889	7697
NEBRASKA			
Grand Island	285	5783	6272
Lincoln (CO)	245	5334	5833
Lincoln	119	5356	6066
Norfolk	308	6359	7005
North Platte	341	6108	6487
Omaha	235	5412	6128
Scottsbluff	297	5887	6760
Valentine (CO)	344	6208	6992
NEVADA			
Elko	302	6676	7152
Ely	331	6800	7243
Las Vegas	12	2361	2425
Reno	201	5364	5871
Tonopah	123	4988	5722
Winnemucca	238	5765	6258
NEW HAMPSHIRE			
Concord	345	6764	7530
Mt. Washington	962	12757	
NEW JERSEY			
Atlantic City (CO)	201	4239	4717
Newark	192	4633	5241
Trenton (CO)	192	4524	5057
NEW MEXICO			
Albuquerque	59	3785	4389
Clayton	248	4626	5114
Roswell	47	3176	3424
NEW YORK			
Albany	301	6340	6912
Binghamton	365	6738	7449
Buffalo	335	6060	6766
New York (CO)	198	4422	5032
La Guardia Field	176	4262	4979
Rochester	330	6229	6809
Schenectady	267	6078	
Syracuse	290	6118	6483
NORTH CAROLINA			
Asheville (CO)	238	3918	4067
Asheville	270	4373	
Charlotte	118	3015	3205
Greensboro	174	3628	3810
Hatteras (CO)	34	2138	2392
Raleigh	144	3218	3369
Wilmington	43	2226	2323
Winston-Salem	146	3377	3721
NORTH DAKOTA			
Bismarck	420	8048	8917
Devils Lake (CO)	503	9067	9803
Fargo	456	8588	9173
Grand Forks	483	9053	
Pembina	463	9130	
Williston (CO)	432	8181	8930
OHIO			
Akron	334	5822	6153
Cincinnati (CO)	184	4030	4532
Cincinnati	238	4624	5172
Cleveland (CO)	288	5077	5668
Cleveland	263	5318	5960
Columbus	258	5018	5584
Dayton	267	5043	5558
Sandusky (CO)	268	5151	5818
Toledo	317	5681	6334
Youngstown	335	5887	6119
OKLAHOMA			
Oklahoma City (CO)	40	3177	3519
Oklahoma City	132	3333	3644
Tulsa	95	3217	3584
OREGON			
Astoria	387	4737	
Burns (CO)	303	6093	6759
Eugene	306	4484	4654
Meacham	473	6901	7561
Medford	157	4236	4478
Pendleton	204	4843	5153
Portland (CO)	203	3879	4073
Portland	254	4405	4539
Roseburg	266	4139	
Salem	287	4542	4483
Sexton Summit (CO)	388	5682	5947
PENNSYLVANIA			
Allentown	235	5370	5855
Harrisburg	194	4810	5244
Park Place (CO)	355	6537	7090
Philadelphia (CO)	145	4041	4523
Philadelphia	153	4354	4866
Pittsburgh (CO)	220	4552	5035
Pittsburgh	294	5302	5869
Reading (CO)	172	4518	5049
Scranton (CO)	255	5493	6012
Williamsport	230	5522	5873
RHODE ISLAND			
Block Island	346	5095	5747
Providence	297	5476	6067
SOUTH CAROLINA			
Charleston (CO)	5	1591	1769
Charleston	23	1916	1973
Columbia (CO)	51	2117	2284
Columbia	69	2395	2435
Florence	49	2234	2507
Greenville	107	2852	3060
Spartanburg	103	2915	3044
SOUTH DAKOTA			
Huron	401	7364	7822
Pierre	341	6772	
Rapid City	349	6278	7387
Sioux Falls	385	7265	7768
TENNESSEE			
Bristol	217	4036	4148
Chattanooga	132	3203	3384
Knoxville	162	3439	3590
Memphis	81	2915	3137
Nashville	152	3436	3513
TEXAS			
Abilene	63	2344	2657
TEXAS (Cont'd.)			
Amarillo	173	3716	4345
Austin	16	1602	1713
Brownsville	0	491	617
Corpus Christi	5	765	1011
Dallas	55	2166	2272
Del Rio	8	1394	1407
El Paso	13	2434	2641
Ft. Worth	57	2252	2361
Galveston (CO)	9	1024	1211
Galveston	9	1070	1233
Houston (CO)	13	1119	1276
Houston	14	1242	1388
Laredo	0	789	781
Lubbock	115	3324	3587
Midland	50	2346	
Port Arthur	15	1389	1517
San Angelo	31	2123	2107
San Antonio	10	1380	1579
Victoria	11	1053	1126
Waco	30	1957	2025
Wichita Falls	93	2617	3025
UTAH			
Milford	185	5818	6368
Salt Lake City (CO)	136	4660	5399
Salt Lake City	163	5070	5785
VERMONT			
Burlington	320	7165	7793
VIRGINIA			
Lynchburg	201	3916	4148
Norfolk	112	3108	3454
Richmond	151	3631	3955
Roanoke	205	3916	4152
WASHINGTON			
Olympia	366	5334	5318
Seattle (CO)	247	4210	4331
Seattle	336	5110	5120
Spokane	299	6206	6706
Stampede Pass (CO)	693	8796	8711
Tatoosh Island (CO)	462	5272	5394
Walla Walla (CO)	155	4347	4810
Yakima	229	5638	5792
WEST VIRGINIA			
Charleston	225	4134	4409
Elkins	354	5642	5720
Huntington (CO)	182	3961	4068
Parkersburg (CO)	207	4385	4737
WISCONSIN			
Green Bay	468	7332	8152
La Crosse	354	6666	7576
Madison (CO)	363	6473	7221
Madison	370	6506	7335
Milwaukee	415	6364	7096
WYOMING			
Casper	373	6627	7492
Cheyenne	444	6444	7389
Lander	368	6718	8140
Rock Springs (CO)	313	6653	
Sheridan	394	6776	7742
ALASKA			
Anchorage	507	10746	10450
Annette Island	494	6861	6775
Barrow	1503	19796	19061
Bethel	584	12957	12508
Cordova	642	9367	9144
Fairbanks	441	14297	13965
Juneau	575	8738	8546
Kotzebue	867	15295	15500
McGrath	472	14322	14107
Nome	755	13657	13510
Northway	616	16038	15194
St. Paul	920	10786	10134
Yakutat	649	9104	8889

Data from airport unless otherwise specified.
CO indicates data from city office.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4

MAY 1954

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Albany County (northern portion) Wyo.	April 30-May 1		*30	40			$5,000	$1,000	Ice (glaze)	
Copiah County, Miss.	1	2 a.m.			1	0	25,000	50,000	Wind and rain	Heavy damage to crops, mostly corn. 1 man killed when high tension wire fell across automobile.
LeFlore County, Miss.	1	Early a.m.			5	4	15,000	50,000	do	Heavy rains and high winds over wide area, but heaviest damage in Greenwood. 2 automobiles collided near Greenwood during heavy rain, killing 5 and injuring 4 persons. Damage to trees, stores, and power lines from high winds. Much corn blown down and other crops flooded.
Washington County, Miss.	1	Early a.m.			1		5,000	25,000	do	
Attala County, Miss.	1	Early a.m.			1	0	1,000	Some	do	Man killed when car skidded on wet pavement.
Hinds and Madison Counties, Miss.	1	Early a.m.			1	0	100,000	100,000	do	1 man drowned in local floodwaters at Jackson during torrential downpour and windstorm.
Morehouse, East Carroll, and West Carroll Parishes, La.	1	Early a.m.					25,000	10,000	Rain, wind, and electrical	Severe electrical-, wind-, and rainstorm flooded highways, creeks, fields, stores, and homes; several homes struck by lightning.
Dardanell and vicinity, Ark.	1	Afternoon and night					Considerable	Considerable	do	Many hundred acres of farmland covered by water, necessitating replanting of cotton. Minor wind damage to trees and TV antennas. Chicken-house, with 6,000 chickens inside, struck by lightning and destroyed by fire.
Comanche County, Okla.	1	2-2:30 p.m.	*5	15			50,000	65,000	Hail	A large number of hail losses reported.
Tillman and Kiowa Counties, Okla.	1	2:10-4:30 p.m.	440	20	0	3	407,000	0	Tornado and hail	Tornado originated in State of Texas, moved north-northeastward through Oklahoma from southwestern Tillman County to east of Tipton, into Kiowa County near Snyder. In Oklahoma considerable damage to 20 homes and barns, 1 school, and 1 cotton gin. Tornado observed by many persons. Accompanied by moderate hail (size of golf balls). Damages in Kiowa County estimated at $5,000 by tornado, and $2,000 by hail. Damages by tornado in Tillman County estimated at $400,000. Only minor hail damage in Tillman County. Hail fell just before tornado struck. Chickens stripped of feathers.
Crowell-Elliott areas, Foard and Wilbarger Counties, Tex.	1	2:15 p.m.	*2	40	0	2	100,000	1,250	Tornado and electrical	Moved northeastward. Damage light to crops. 5 sets of outbuildings destroyed. Lightning killed 2 head of cattle. 2 homes and oil mill unroofed; 3 homes demolished; automobile picked up and moved ½ mile. Crossed Red River into Oklahoma.
Davidson (west of), Tillman County, Okla.	1	3:30 p.m.	Narrow	Short	0	0	10,000	0	Tornado	3 farmsteads damaged. Funnel touched earth for about 10 minutes.
Tillman and Cotton Counties, Okla.	1	4 p.m.	Narrow	12	2	4	500,000	1,000,000	Tornado and hail	From near Grandfield, Tillman County, to Ahpeatone areas, Cotton County. About 10 places damaged. Deaths and injuries occurred in Cotton County. Extensive hail losses throughout Cotton County estimated at $1,000,000 to wheat crop.
Broxton and Washita, Caddo County, Okla.	1	4:50-4:55 p.m.	300	10	0	0	10,000	0	Tornado	3 frame houses damaged; more than a dozen barns and other buildings destroyed. Considerable damage to houses and barns a mile north of Broxton. Moved northeastward.
Stephens County, Okla.	1	5:30-11:30 p.m.			0	0	110,000	25,000	Wind, rain, hail and tornado	In Duncan winds estimated at 90 m.p.h. Insurance men estimated $2,000 damage and loss claims to business houses and homes. Also extensive damage to utility lines. In Marlow, tornado struck at 5:45 p.m., and in a 6-mile long, 100-yard path from south to north caused $10,000 damage. Hailstones, average size 1 inch, caused damage of $25,000 to crops in a 25-mile strip across Stephens County.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Payne, Pawnee, and Osage Counties, Okla.	1	5:42-5:48 p.m.	Narrow	8	0	7	$50,000	$0	Tornado	Path northeastward from Glencoe, Payne County, to west and southwest of Pawnee, Pawnee County, to Cleveland, Osage County. 15 farm homes destroyed, 11 other farm homes damaged, and many other buildings destroyed or damaged.
Cotton, Jefferson, and Stephens Counties, Okla.	1	5:45-6:30 p.m.	300	45	0	0	150,000	0	do	Tornado funnel, described as "barrel-shaped", originated in southern Cotton County and moved northeastward just south of Hastings, to near Addington, to southern Stephens County. Severe weather warnings credited for no lives being lost.
Colgate (1 mile east of), Coal County, Okla.	1	6 p.m.	33	**100	0	0	2,000	500	Hail and tornado	Tornado cloud appeared to have 3 funnels at first, then 1, which came to ground, damaging 1 house, then rose into cloud and dissipated. Estimated damages include $2,000 to buildings by tornado, and $500 damage to crops by hail
Pottawatomie, Lincoln, and Creek Counties, Okla.	1	6-7:20 p.m.	*1½	40	0	65	800,000	20,000	Tornado	From northeast of Dale, Pottawatomie County, through Meeker, Sparks, and Davenport, Lincoln County, to near Depew, Creek County. Damage in Pottawatomie County at 6 p.m. estimated at $500,000 including $16,000 loss to livestock and $20,000 to crops. In Lincoln County at 6:30 p.m. (mostly near Meeker) 32 houses destroyed, 31 damaged; 53 outbuildings destroyed and 4 damaged. Large bus thrown 300 feet, overturned on road east of Meeker. Damage in Creek County at 7:20 p.m. estimated at $15,000 to 12 farms.
Pontotoc (northern portion), Seminole (southeastern portion), Hughes, and Okfuskee Counties, Okla.	1	6-8:10 p.m.	Narrow	50	0	6	45,000	0	Tornado and hail	Damage first noticed in Cedar Grove Community in northern Pontotoc County; as tornado moved northeastward through Sasakwa, Seminole County, and through Hughes into Okfuskee Counties. Damage in or near following areas: Spaulding, Holdenville, Yeager, Wetunika, and Weleetka. Hail, marble to golf-ball size, caused minor damage.
Reform, Ala.	1	6 p.m.					1,000		Thunderstorm with winds	TV aerials snapped; barn, garage, and many telephone lines blown down.
Hutchinson (4 miles west of), Kans.	1	6:05 p.m.	30	1/4	0	0	1,000	0	Tornado	Small funnel which moved northeastward observed; 2 farm buildings destroyed.
Bowlegs and Excelsior Communities in Seminole County, Okla.	1	6:15 p.m.	100	**200	0	0	20,000	0	do	Very small funnel; touched ground for a short time then traveled northeastward to Excelsior area where extensive damage to 20 houses.
Independence (1½ miles east of), Montgomery County, Kans.	1	6:30 p.m.	33	5	0	0	25,000	0	Tornado, electrical, and rain	Moving north and north-northwestward, tornado dipped to destroy buildings on several farms along 5-mile path. Funnel observed and roar described as similar to passing train. Storm accompanied by severe lightning and heavy rain.
Altamont (5 miles southeast of), Labette County, Kans.	1	6:30 p.m.	*1	5	0	0	10,000	10,000	Wind, hail, and tornadoes (probable)	Severe wind destroyed or damaged barns on several farms. Roofs riddled and few fields of small grain suffered total loss from hail. Man picked up by wind and set down on woodpile. Unconfirmed report of 3 funnels seen, one touching ground. Property damage from wind $10,000; crop damage from hail $10,000. Moved northeastward. Hailstones average size of birds' eggs, largest golf-ball size.
Most of Jefferson and portions of Thayer and Saline Counties, Nebr.	1	Evening	*18	24			35,000	2,000,000	Hail	Winter wheat wiped out.
Republic County (northeastern portion), Kans.	1	7 p.m.	*1-1½	15			10,000		Wind and hail	At least 3 areas of wind damage from 4 miles north of Belleville eastward to Washington County line. Damage to barns and sheds on several farms. Moved southeastward.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Lamar, Mo.	1	7 p.m.					$1,000		Hail	Extensive damage to glass of 2 greenhouses and to roofs in town.
Antelope, Jack County, Tex.	1	7 p.m.			0	4			Tornado	Destroyed 1 home, injuring 4 persons.
Cromwell (1½ miles northwest of), Seminole County, to rural area in western Okfuskee County, Okla.	1	7:05-7:10 p.m.	220	5	0	0	50,000	0	do	Path north-northeastward. 2 funnels joined; when they came together their lateral movement stopped for 4 or 5 minutes during which time the funnel rose into cloud and dipped back to earth 10 to 15 times.
Pittsburg and southern McIntosh Counties, Okla.	1	7:20-8:20 p.m.	400	30	0	6	34,000	0	do	Tornado first observed in wooded area near Naval Ammunition Depot, southwest of McAlester, at 7:20 p.m. where $30,000 damage in 2-mile long path. Tornado later observed west of McAlester where some trees damaged. In northern part of county near Canadian tornado between 8 and 8:20 p.m. in path 8 miles long damaged 9 homes, injured 6 persons, and caused $4,000 damage. Only minor damage in southern McIntosh County.
Pocassett, Grady County, Okla.	1				2				Rain	2 persons drowned when swept into creek.
Hot Springs, Ark.	1	7:30-10:30 p.m.					5,000		do	Heavy rains which dumped nearly 5 inches of rain in 3 hours' time caused extensive local flooding in business section of Hot Springs.
Cleveland County, Ark.	1						Extensive	Extensive	Hail and wind	Wind damage to farm home and several other buildings near Rye and in Oak Grove Community, Saline Township. Crop damage ranged from complete loss in some areas to minor in others.
Between Little Rock, Jacksonville, and Scott, Ark.	1-2	10:30 p.m.-1:30 a.m.	*5	Long	1			10,000	Hail and rain	Damaged truck crops, gardens, and cotton. Excessive rains caused extensive local flooding along drainage creeks. Boy drowned when he rode his bicycle into flooded drainage ditch in North Little Rock.
Saline County, Ark.	1-2						50,000	Minor	Rains	Heavy, washing rains with damage to roads and bridges.
White County, Ark.	1-2						Considerable	Minor	Wind, hail, and rain	Most damage in Searcy area.
Nebraska, central portion	1-2	Night and morning					12,000		Ice (glaze)	Heavy damage to wires, poles, television aerials, and trees over large area.
New Madrid County (southwestern portion), Mo.	2	2 a.m.	Narrow	Short	0	0	21,000	0	Tornado	Damage to farm property 5 miles northeast of Gideon. 3 houses, 2 barns, and 1 garage destroyed or severely damaged. Funnel cloud seen aloft over Sikeston at 2:30 a.m.
Pleasant Grove, Hopkins County, Tex.	2	4:30 a.m.					2,000		Wind	Barns destroyed or unroofed.
Miller County, Ark.	2	6:30-6:35 a.m.	50	3	0	0	3,500	0	Tornado	Path northeastward; 3 farms damaged.
Gladewater, Gregg County, Tex.	2	6:50 a.m.							Wind	Roof of lumber company blown off.
Hayworth (4 miles south of), McCurtain County, Okla.	2	7:40 a.m.	50	2	0	0	1,500	0	Tornado	Small area in extreme southeastern McCurtain County affected.
Tobinsport, Perry County, Ind.	2	A.m.					6,000		Wind	Wind severely damaged several barns. Some trees blown down.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons Killed	Number of persons Injured	Estimated damage Property (exclusive of crops)	Estimated damage Crops	Character of storm	Remarks
Clark County, Ark.	2	9-10 a.m.			0	0	Extensive	$0	Tornado, wind, and rain	Tornado reported at Okolona, southwest of Arkadelphia about 9:15 a.m., where 2 barns and other buildings damaged. Later several houses and a number of trees north of Arkadelphia damaged with some evidence of tornadic action. Throughout County 5 barns, several residences, and other buildings damaged. Creeks and drainage ditches flooded.
Dell, Mississippi County, Ark.	2	9:30 a.m.	Narrow	Short	0	0	$3,000	0	Tornado	Several buildings damaged in eastern part of community.
Stuttgart, Ark.	2	11 a.m.	Narrow	Short	0	0	Considerable	0	do	Tornado sucked concrete blocks supporting grainery out of ground. Oak limb found in middle of rice field, with nearest timbers a mile away. Plate of window glass carried some distance.
Ohio County, Ky.	2	11-12 a.m.	25	6	0	0	5,000		do	Tornado of bounding type moving northeastward uprooted trees, leveled shrubbery, ripped roofs and sidewalls of a few buildings and demolished a barn. Dipped to ground 4 miles east of Point Pleasant. Damage also near Centertown and Hartford.
McLean County, Ky.	2	A.m.					3,000		Wind	Storm blew down power lines, and either razed or damaged buildings on at least 4 farms. Moved northeastward.
Ogden Dunes (6 to 8 miles north of), Ind.	2	1:15 p.m.			0	0	0	0	Waterspouts	2 waterspouts observed in Lake Michigan, lasting about 5 minutes. 1 spout elongated horizontally for most of its length, with several bends in it before it curved sharply downward to Lake. Moved west-northwestward.
Lexington, Ky.	2	2:55 p.m.	12	**100	0	0	200		Dust devil	A large and violent dust devil damaged roof of hangar office, and wing of a cub plane. Moved northeastward.
Kentucky, extreme northern portion	2	3:30 p.m.					2,000		Wind	Gusts between 40 and 60 m.p.h. ripped roofs, downed trees, and broke windows.
Cincinnati, Ohio	2	3:30 p.m.	10-40	1	0	1	250,000	0	Tornado	Vicious tornadic winds ripped through northern and eastern sections of Cincinnati and Hamilton County. Winds 60 m.p.h. at Airport in Kentucky and 70 m.p.h. a short time later at Dayton airport in Ohio. Roofs torn away, big trees sheared off, and power lines downed. Numerous cars and homes damaged by falling trees.
Middletown and Franklin, Ohio	2	3:45 p.m.				5	500		Wind	Tree fell on car during windstorm and injured 5 persons. Balance of damage minor and caused by fallen trees, a few on homes.
Tallesboro, Lewis County, Ky.	2	5 p.m.					6,000	1,000	Electrical	Large tobacco barn struck by lightning and completely destroyed by fire.
Ohio, northwestern portion	2	6 p.m.			0	0			Tornadoes	2 small tornadoes, 10 miles and 10 minutes apart, 30 miles west of Lyons. Another black funnel observed 3 miles south of Hamler at 6 p.m. Weather observer saw a tornado about 15 miles northwest while driving about 5 miles east of Columbus Grove. All of these small tornadoes in same general northwestern area of Ohio, and no damage reported.
East Baton Rouge Parish, La.	2-3	Night					15,000	Slight	Rain	Flooding rains, mostly in southern Baton Rouge, flooded homes, stores, and hospital; stalled traffic, and caused minor injuries. 1 man revived after carbon monoxide gas overcame him in automobile, stalled by flooded streets.
Union City, Obion County, Tenn.	3	9:45 a m.	300	3	0	0	5,000	0	Tornado	About 350 phones out of order and roofs of 4 business houses and 3 homes damaged. Storm moved northeastward.
Toccoa, Ga.	3								Wind and rain	Plate-glass windows broken, roofs of homes damaged, and TV aerials broken.
Lovettsville, Va.	3	Afternoon							Tornado and rain	Heavy spot damage to telephone and power lines, roofs and buildings. Crossed river to Brunswick, Md.
Brunswick, Md.	3	Afternoon							do	Crossed river from Lovettsville, Va. Heavy spot damage to telephone and power lines, roofs, and buildings.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Washington, D.C. and vicinity	3	3-7 p.m.				2	$15,000		Wind, rain, and electrical	Occurred in District of Columbia, Arlington and Alexandria, Va., and Prince Georges County, Md. Damage by wind $2,000, by lightning $3,000, and by high water to basements, residences, automobiles, etc., $10,000.
Centreville and vicinity, Fairfax County, Va.	3	3:30-4 p.m.		5					Wind and hail	Some windows broken by hail. Some buildings unroofed or otherwise damaged by wind. Hailstones averaged 1 inch in diameter, with largest 2 inches. Winter wheat damaged, also various garden and truck crops. Storm moved east-southeastward.
Westminister, Oconee County, S. C.	3	3:30 p.m.					1,000		Wind (possible tornado	Outhouses and trees destroyed. Type of damage indicates possible tornado, although no tornado cloud reported.
Aaronsburg, Pa.	3	4:30 p.m.							Electrical and rain	Lightning knocked hole in church roof. Heavy rains caused much water damage, badly washed gardens.
Amelia County, Va.	3	P.m.				1			Wind	Dump truck body blown over on boy.
Stanly, County, N. C.	3	P.m.			1				Electrical	Man killed by lightning.
Renovo area, Pa.	3	6 p.m.		3/4	0	0			Tornado (probable) and rain	Unroofed 2 milk houses. Demolished 3-car garage. Barn and porch of home damaged to extent of $3,000. Blew down 30 apple trees in orchard, and other trees along 3/4-mile path, as well as utility lines. Heavy rains caused local flooding as sewers clogged.
Stewartstown, Pa.	3	Evening				1			Electrical and rain	Lightning exploded an electric meter and shocked a man. Heavy rains flooded underpasses and many cellars.
Reading area, Pa.	3	Night							Electrical rain, and wind	Lightning damaged power lines. Heavy rains undermined foundation wall of new house basement which collapsed. Wind felled trees which in turn damaged utility lines and blocked streets.
Philadelphia, Pa.	3	Night							Electrical	Lightning demolished 1 chimney and damaged another, tore 2 holes in roof, and knocked out power in home.
Syracuse and vicinity, Onandaga County, N. Y.	3-4	Night					200,000		Rain	Heavy rain undermined a 200-foot section of main highway at Marcellus, 10 miles southwest of Syracuse, causing estimated damage of $75,000, while roads and streets in city of Syracuse suffered $50,000 damage. Other roads and highways in area suffered to lesser degree while numerous viaducts, intersections, and cellars were flooded.
Okeechobee County, Fla.	6	Afternoon							Hail	Stones as large as baseballs. Storm covered small area.
Noble, Grant, and Alfalfa Counties, Okla.	6	3:30-7 p.m.					2,000	$105,000	do	Hail covered large area in the 3 counties. Most damage in northern Noble County near Billings where hail losses estimated at $101,000 with 5,000-6,000 acres of wheat severely damaged. In Alfalfa County losses estimated at $6,000.
Pawnee (2 miles southeast of), Pawnee County, Okla.	6	6:15-6:20 p.m.	440	2			5,000		Wind	Damage to 1 farm home, 1 airplane, and 1 airplane hangar. Storm moved northwestward.
Mt. Pleasant (1½ miles east of), Iowa	7	Evening					600		do	Destroyed poultry house.
Northern and eastern New Hampshire, adjoining counties of Maine, eastern Massachusetts (except Cape Cod), and Northern R. I.	8-11				10				Rain	A heavy, driving southeast rainstorm on 8th and 9th flooded lowlands along all northern New Hampshire and east-central New England rivers and coastal drainage areas including northern Rhode Island. Deaths due to highway accidents and drownings. Many roads washed out, and widespread damage to cellars of homes and commercial or industrial establishments. Flooding of fields continued to delay farmwork. Although total loss in millions, no reliable estimate available.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Blevins Community (near Nashville), Ark.	9	Morning					$1,000		Electrical	Lightning killed 5 cows near wire fence on farm.
Idaho, southwestern and south-central counties	9	Afternoon and evening			2				Winds and dust	2 fishermen lost their lives when their boat capsized on Lake Lowell in Canyon County. Observer at Shoshone reported "gale" at 6 p.m. Twin Falls reported duststorm. Maximum wind at Boise Airport 36 m.p.h. from west.
Blaine and Canadian Counties, Okla.	9							Considerable	Hail	Considerable loss to crops, principally in Canadian County.
Ellington, Conn.	10	9:20 a.m.	35	**440	0	2	20,000	$1,000	Tornado, rain, and hail	Tornado occurred in Pinney and Windsorville section, about 2½ miles southwest of center of Ellington. Eight-room house, barn, and 3 tobacco sheds demolished. Tornado made up of 3, possibly 4, funnel-shaped clouds. Storm preceded and accompanied by heavy rain and hail (chunky, up to ice-cube size).
East Hartland, Conn.	10	12:55 p.m.	50-100	**1300	0	0	1,000	0	Tornado	Ill-defined and poorly developed; not associated with earlier occurrence at Ellington. Path almost entirely above ground at about tree-top level. Damage to trees and a few tents on grounds of a Girl Scout Camp; small garage demolished, and another roof damaged.
Hampden County, Mass.	10	P.m.							Hail	Early vegetables heavily damaged by hail in Chicopee-Springfield area. Disheartening blow to farmers who had counted on premium prices from May-maturing vegetables.
Moriarty (5 miles west of), N. Mex.	10	P.m.					1,000	1,000	do	
Lumpkin Community, Dawson County, Ga.	11					4			Electrical	Lightning struck home, tearing holes in walls, ripping out all screens, breaking several windows, and stunning the occupants.
New Smyrna Beach (west and south of), Volusia County, Fla.	11	Afternoon							Hail	Stones 1 inch to baseball size, but only [illegible] of larger ones. Some damage to cabbage and peppers.
Cedar Park, Williamson County, Tex.	11	8:22 p.m.			0	0	0	0	Tornado	Funnel-shaped cloud reported by Texas Highway Department; did not touch ground.
Miami, Fla.	13	9 a.m.				1			Wind	Squall line developed destructive winds that broke trees, shrubbery, windows, awnings, and TV aerials, mostly in northwest Miami.
Montgomery, Ala.	13	Afternoon	880	2			10,000		Thunderstorm with winds	Winds estimated at 70 m.p.h. Trees blown down and TV antennas, trellises, and shrubbery severely damaged in Cloverdale and Edgemont sections; also awnings and neon signs blown down.
North Carolina, coastal areas from Hatteras southward	13-14	Night			1		600,000		Wind and rain	Damage estimate includes 14,000-ton freighter destroyed at Hatteras. Skipper of vessel died from heart failure. U.S. Engineers estimate beach damage in Wilmington area over $100,000.
Coconut Grove, Fla.	15	Afternoon				2			Wind, hail, and electrical	Winds estimated at 50 m.p.h. shifted suddenly and capsized 27 sail boats anchored in yacht basin, snapping a few masts. Light hail accompanied wind. 1 person injured by lightning.
Scottsbluff and Morrill Counties, Nebr.	15	Afternoon			0	0	Light	Light	Tornado and hail	Small tornado cloud reported, but passed over open country.
Lushton (near), Nebr.	15	Afternoon					2,600		Electrical	3 cows and 4 calves killed. Barn filled with hay and oats burned.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Cairo (near), Nebr.	15	Afternoon	•2	4	0	0	Minor	Heavy	Hail and tornado	Tornado cloud observed by many, but passed over open country.
Alliance (4 miles west of), Nebr.	15	2:30-3 p.m.	•3	8			$800	$24,200	Hail	Stones ½ to 1-1/4 inches in diameter; 60 percent of ground covered, some 1 inch deep.
Otoe County (eastern portion), Nebr.	15	2:30-3 p.m.	•2	5			5,000	70,000	do	
Seward County (southwestern portion), Nebr.	15	4-4:30 p.m.	•2	3-3½			2,000	60,000	do	
Hall County (northeastern portion), Nebr.	15	4:30-6:30 p.m.	•7	15	0	0	Minor	Minor	Tornado and hail	Tornado observed, but caused no damage.
York County (east-central portion), Nebr.	15	5-6 p.m.	•½	2				5,000	Hail	
Sarpy County (northwestern portion), Nebr.	15	5-6 p.m.	•2	2			None	1,000	do	
Atwood (east of), Rawlins County, Kans.	15	5 p.m.	•4	5			5,000	95,000	do	Hailstones from 1/2 inch in diameter to hen-egg size broke windows, riddled roofs, and destroyed wheat and pasture grass.
Deuel County (northeastern portion), Nebr.	15	5:15-6:30 p.m.	•3	8				75,000	do	
Burr (near), Nebr.	15	Evening					Considerable		Electrical	Barn struck and burned.
Leoville and vicinity Decatur and Sheridan Counties, Kans.	15	6 p.m.	•2-4	12				40,000	Hail	Hailstones 1/2 inch to 3/4 inch in diameter covered ground to depth of 3 inches, destroying wheat in path from about 8 miles northwest of Leoville to 4 miles southeast.
Kearney County (northeastern portion), Nebr.	15	6-6:30 p.m.	•2	2½				7,500	do	
Hastings and vicinity, Nebr.	15	7:30-8 p.m.	•3-4	6-8			9,500	500	do	Stones 1/4 to 1 inch in diameter. Ground one-half covered.
Keith and Arthur Counties (near border of), Nebr.	15-16	7-11 p.m.	•½-1½			5	20,000	150,000	do	Largest stones 4 inches in diameter. Ground completely covered in middle of path.
Lovington (12 miles west of), N. Mex.	16	2 p.m.	100	½	0	0	500	0	Tornado	Over open country; minor damage to telephone lines.
Jal (5 miles north of), N. Mex.	16	4:30 p.m.			0	0	0	0	do	Moved north-northeastward over open country.
Trinidad (25 miles southeast of), Las Animas County, Colo.	16	5 p.m.			0	0	0	0	do	In sparsely populated area.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Pine Bluffs, Laramie County, Wyo.	16	5:30 p.m.	*3	10			$1,000	$10,000	Hail	Hail 5 inches deep in Pine Bluffs. Stones ½ inch in diameter.
Scranton, Pa.	16	11:30 p.m.							Electrical	Lightning started a barn fire and knocked out windows in 3 homes.
Sublette (near), Haskell County, Kans.	17	12:30-1:15 p.m.			0	0	0	0	Tornadoes	7 large funnels reported observed aloft in 30-mile radius of Sublette; no damage. Moved eastward.
Tucson and vicinity, Ariz.	17	1:20 p.m.			0	0	5,000		Wind and "dust devils"	Strong winds and some "dust devils", accompanying thunderstorms, unroofed several buildings and caused minor damage to power and communication lines and poles.
West Palm Beach, Fla.	17	2 p.m.							Hail	Heavy hail with many saucer-shaped stones at West Palm Beach and southward. Stones ½ inch in diameter.
Socorro (25 miles southeast of), N. Mex.	17	3 p.m.			0	0	0	0	Tornado	Reported over open country.
Clayton, N. Mex.	17	P.m.					5,000	500	Rain and hail	Most of damage caused by flooding in Clayton.
Roswell, N. Mex.	17	P.m.					747,000	34,000	Rain	Most of property damaged in city of Roswell due to flooding. 295 dwellings flooded, 1 totally destroyed.
Lovington, N. Mex.	17	7 p.m.			0	0	125,000	125,000	Tornado rain, and hail	Tornado damage limited to 1 car demolished. Principal property damage from flooding; 1,000 homes damaged to some extent. Rain and hail damage to cotton, alfalfa, and small grains.
Jal (5 miles northwest of), N. Mex.	17	8 p.m.	50	6	0	0	0	0	Tornado	Moved east-northeastward over open country.
Mosheim, Bosque County, Tex.	18				0	0			Tornado and hail	Unroofed houses; ruined oats; twisted windmill. Hail 5 miles east of Mosheim damaged crops.
Graham and Trego Counties, Kans.	18	5 p.m.	*3½	30			25,000	50,000	Hail	Strip of hail damage from near Norton County line southward through center of Graham County (including Hill City) into northern Trego County.
DeKalb County (southern portion), Mo.	18	7-7:20 p.m.		9			5,000		Wind	Extensive minor damage to 5 houses, 8 barns, several other farm buildings, shade trees, and orchards. Storm moved in northeasterly direction from vicinity of Stewartsville to 5 miles north of Osborn.
Elgin, Bastrop County, Tex.	19	1:25 p.m.	50	1			1,000		do	1,600 square feet of roofing blown from cotton storage yard; other roofs damaged.
Bertie, Wake and Harnett Counties, N. C.	19	5-9 p.m.					10,000	10,000	Wind, hail, and rain	Several heavy local thunderstorms early evening. Most property damage in Harnett County.
Smoky Mountains National Park, Sevier-Cocke Counties to western N. C.	19								Snow	Snowstorm hit higher peaks of park, but no damage resulted. Since it was so late in season, the festivals may have to be delayed.
Vero Beach (10 miles northeast of), Fla.	20	Morning			0	0	0	0	Waterspout	Sighted by crew of Marine aircraft.
Spartanburg, Greenville, and Union Counties S. C.	20	9-10 a.m.				5	4,000	270,000	Hail and electrical	Crop damage by hail mostly in Spartanburg area. 5 persons in 1 home knocked unconscious by lightning, but none seriously injured.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

MAY 1954

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Beaufort, Pamlico, Hertford, Martin, Greene, Lenoir, Nash, Pitt, Franklin, Sampson, Hoke, Cumberland, Scotland, Cleveland, Rutherford, Guilford, Robeson, and Wayne Counties, N. C.	20	Afternoon and evening					$20,000	$500,000	Hail, wind, and rain	Widespread heavy thunderstorms produced unusually heavy falls of hail over limited local areas; some reported 6 or more inches deep, requiring plows to clear roads. No unusually large stones reported. Some local wind damage.
Deming, N. Mex.	20	2 p.m.						270,000	Hail	Approximately 2,100 acres of cotton damaged to some extent.
Helena, Lewis and Clark County, Mont.	20	3 p.m.							Electrical	Damaged CAP aircraft by direct strike on tail section, burned several holes in fuselage. Plane grounded at time.
Grand Rapids, Mich.	20	4:20-4:25 p.m.	3	**200	0	0	200	0	Whirlwind	On hot, sunny day, noisy whirlwind or dust devil picked up garbage cans, dog house with dog inside, and bent an aluminum awning back over roof. Moved southward.
Edgemont, Fall River County, S. Dak.	20	5-9 p.m.					25,000		Rain	Torrential downpour brought 4½ inches of rain (official gage) (unofficial 5.7 inches in area); nearly 2½ inches of this fell in 1 hour (5-6 p.m.). 42 homes flooded; 2 miles of railroad track washed out; telephone services disrupted; local roads damaged; Cheyenne River filled to its banks.
Phoenix and vicinity, Ariz.	20	6:48 p.m.				1	12,000		Winds	Strong winds (peak gust 59 m.p.h. at Phoenix Airport), accompanying thunderstorms, caused considerable blowing dust. At height of storm several buildings and sheds unroofed; most damage by falling trees and limbs which interrupted power and communications. Injury caused by motorcyclist running into felled tree. Storm moved southeastward.
Northampton and Hoke Counties, N. C.	21	Afternoon						2,000	Hail	2 square miles slightly damaged.
Stansbury, Sweetwater County, Wyo.	21	2 p.m.					500		do	Hail 6 inches deep on streets. Stones ½ inch in diameter.
Corydon, Iowa	22	Early a.m.					5,000		Electrical	Fire destroyed home.
Hessel (2½ miles north of), Mich.	22	Noon			0	0	8,000	0	Whirlwind	Whirlwind or dust devil ripped farm house roof and demolished cement block farm shed.
Marshalltown, Iowa	22	12:30 p.m.					1,000		Electrical	6 houses damaged.
Helena, Lewis and Clark County, Mont.	22	2:30 p.m.							do	Direct strike set house furniture afire; house undamaged.
Otis, Washington County, Colo.	22	5-5:30 p.m.	*10	10				25,000	Hail	Hailstones ½ inch in diameter.
Box Butte County, Nebr.	22	5:20-6:15 p.m.	*1-2	12			4,000	12,000	Hail and wind	Stones ½ to 1-1/4 inches in diameter. 60 percent of ground covered in center.
Dunlap (near), Nebr.	22	Evening	Narrow	Short	0	0	Minor	Minor	Tornado	A few small hog houses upset. Tornado cloud observed.
Jay Em, Goshen County, Wyo.	22	10:00 p.m.	17	**215	0	0	300	0	do	Barn damaged. Storm moved westward.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Bondurant, Sublette County, Wyo.	22						$20,000		Rains	High water on Hoback River washed out 3 bridges.
Crosbyton, Crosby County, Tex.	22	10:30 p.m.	*2	6			10,000	$300,000	Hail	3,000 acres of wheat damaged up to 100 percent; 3,000 acres damaged to lesser degree. Damage amount includes hailstorm on 23d in Crosby County.
Wichita, Kans.	23	1:30 p.m.				1	500		Electrical	Woman knocked unconscious; cement walk, automobile and house trailer damaged by lightning.
Woods and Grant Counties, Okla.	23	Afternoon	*1	3				12,500	Hail	Scattered damage.
Kress and vicinity, Swisher County, Tex.	23		*2	15				100,000	do	South-central Swisher County damaged. Largest hail size of golf balls.
Crosbyton, Crosby County, Tex.	23	3 p.m.	*2	6					do	About same size acreage of land damaged northeast of Crosbyton as damaged southeast on 22d. 3,000 acres 100 percent damaged; 3,000 acres to lesser degree. Damage included in storm of 22d in Crosby County.
Osage, Iowa	23	6 p.m.			0	0	1,500	0	Tornado	Destroyed machinery shed, windmill, and pumphouse. Minor damage to nearby farms.
Ely, Iowa	23	8:15 p.m.			0	0	1,000	200	do	Destroyed machine shed and laying house and damaged house and brooder house. Unroofed corn crib and uprooted trees.
Minnesota, southeastern portion	23	P.m.					50,000		Thunderstorm with rain	Several barns and a number of outbuildings demolished; buildings damaged; trees uprooted; poles and wires down; 13 head of livestock perished in collapse of barn; small boat on lake capsized; plate-glass window blown in. Storm moved northeastward, accompanied by heavy rains.
Minnesota, southeastern portion	23	P.m.					20,000		Electrical	A number of places struck by lightning. A farm home and 2 barns entirely destroyed by fire. Communication and power lines damaged.
Jackson, Kiowa, and Greer Counties, Okla.	23	9-10 p.m.	*5	25	0	0	4.200	2,000	Tornado, hail, wind, and electrical	Scattered hail damage totaling $2,000 to wheat crop in Jackson County. Tornado struck 1 farmstead with about $1,500 property damage. Wind damaged 2 barns with about $2,000 loss. Lightning killed 5 cattle in pasture, with loss estimated at $700.
Walters (near), Cotton County, Okla.	24	Late morning			0	0	0	0	Tornado	Tornado funnel observed moving in northeasterly direction; stayed in air and caused no damage. Observed by several persons.
Bromide, Johnston County, Okla.	24	4:55 p.m.	Narrow	Short	0	0	Considerable	0	Tornado and rain	Accompanied by downpour of 4½ inches of rain in less than 25 minutes. Considerable damage to trees, and residences by tornado.
Calcasieu Parish, La.	25	5:30 a.m.					5,000	Slight	Wind	Damaged several buildings and power lines in town of Vinton. No evidence of tornado.
Laketown, Utah	25	Noon			0	0	8,000	0	Tornado	2 barns blown down, trees uprooted, some small buildings tipped over, no power for several hours. No funnel shaped cloud seen. Became dark and wind started blowing violently from southwest. Dust, hay, straw, and twigs of trees were all in air together. Damage in area 4 blocks long and 2 wide. No rain anywhere in valley. A few strips of tin roofing blown off; chicken coop moved 8 feet; new barn flattened; small outbuilding tipped over; tops of trees blown across road; trees torn down; barn lifted high enough to clear 8-foot shed, turned half way around, then dropped and smashed. A roar for 2 or 3 seconds, then calm. Wind came from southwest then turned north and left valley. An active cold front passed about noon.
Billings, Yellowstone County, Mont.	25	Afternoon					5,000		Hail and wind	Several brief power service interruptions. Hailstones to ½ inch in diameter.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Thomas, Custer County, Okla.	25	Late Afternoon			0	0	$0	$0	Tornado and rains	Torando funnel observed to touch ground at Thomas. Accompanied by heavy rains.
Porum, Muskogee County, Okla.	25	5:30-5:45 p.m.	Narrow	Short	0	0	Minor	0	Tornado	A number of houses and other small structures unroofed. Moved northeastward.
Afton (southeast of), Delaware County, Okla.	25	Night					10,000		Electrical	1 barn struck by lightning, burned to ground. House struck by lightning, minor damage.
Melvern (south of), Osage County, Kans.	25	Night							do	Barn burned.
Caddo Parish, La.	26	8-9 a.m.					10,000	Slight	Wind and rain	Damaged trees, wires, and small buildings in Shreveport and vicinity.
Ordway, Crowley County, Colo.	26	12-2:30 p.m.					1,500	500	Rains	Bridges and fences washed out.
Akron, Washington County, Colo.	26	2-2:10 p.m.	*1	3				4,000	Hail	
Burlington, Kit Carson County, Colo.	26						1,000	15,000	do	
Idaho, southern part	26	Afternoon and evening							do	Small hail at several widely scattered places. In Canyon, Gem, and Payette Counties some damage to potatoes, onions, and sugar beets. May, in Lemhi County, also reported hail, but little or no damage.
Hinton, W. Va.	26						10,000		Rain	Numerous cross ties floated away.
Syracuse, Hamilton County, Kans.	26	3:30 p.m.	100	½	0	0	50,000	0	Tornado and hail	19 houses damaged, 3 severely, in north residential area of town. Funnel cloud moved southeastward. Heavy hail near Hamilton-Kearney County line following tornado.
Kenneth (near), Rock County, Minn.	26	P.m.					1,100		Electrical	11 head of cattle that were in a huddle in midst of pasture killed.
Bronte, Coke County, Tex.	26	7:30 p.m.	*1½						Hail and wind	Many roofs and autos damaged; chickens killed and some crops destroyed. Trees uprooted. Largest hail size of golf ball.
Newton County (northern portion), Ind.	27				0	0			Tornado	Described by Newton County Enterprise, Kentland, Ind., as "twister" with picture tending to verify such classification.
Scottsbluff County, Nebr.	27	Most of day					2,300	6,000	Wind	Wind blew out 200 acres of sugar beets; replanting costs and reduced yields from later replanting estimated at $30 per acre. Collisions due to blinding dust caused damage estimated at $2,300.
Ethan (6 miles west and 2 miles south of), Davison County, S. Dak.	27	12:58 p.m.	150	1	0	1	11,000	0	Tornado)	Same cloud formation moved northeastward with funnel cloud forming, breaking up, and re-forming from Davison County to McCook County. Damage in Davison County confined to 1 farm, in Hanson County to 5 farms, and in McCook County to 17 farms and 1 elevator at Unityville. Hail heavier and more general around Unityville where stones disc-shaped, 2 inches in diameter, and 1 inch wide reported. Funnel cloud observed by number of eye witnesses. Storm traveled 16 miles in 27 minutes from Ethan to Alexandria and 20 miles in 30 minutes from Alexandria to Unityville.
Alexandria (3 miles south of), Hanson County, S. Dak.	27	1:25 p.m.	100	3	0	1	8,000	0	Tornado)	
Unityville, McCook County, S. Dak.	27	1:55 p.m.	100	10	0	0	30,000	0	Tornado)	

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons: Killed	Number of persons: Injured	Estimated damage: Property (exclusive of crops)	Estimated damage: Crops	Character of storm	Remarks
Marion, Iowa	27	1:30 p.m.					$2,500		Electrical	Burned barn and contents.
South Dakota, southeastern quarter	27	Afternoon					10,000		Hail	Considerable hail in scattered localities. Most hail reports from Minnebaba, McCook, Turner, Douglas, and Union Counties.
Sisseton, Roberts County, S. Dak.	27	Mid-afternoon					5,000		Rain	Official observer measured 5½ inches of rain in 3 periods during afternoon, estimated 7 inches in storm center. Damage most severe in 4-section area where farmland inundated. Some railroad tracks also washed out and some farm animals drowned.
Illinois, northern portion	27	3:10-7:15 p.m.					20,000		Wind and hail	Local windstorms first reported north of Cordora near Mississippi River at 3:10 p.m. and last in Westmont suburb of Chicago at 7:15 p.m. Farm buildings damaged near Cordora and Annawan in western Illinois and in southwestern Page County. At Kaneville 6 shacks unroofed. Town property damaged in Westmont; hail damage in Blackhawk Heights. Many power interruptions.
Edmunds County, S. Dak.	27	3:30-4:10 p.m.	*6				3,000		Hail	Lasted only 5 to 10 minutes; stones varied from 1/4 to 3/4 inches in diameter. Some damage to spring grains, gardens, and minor damage to buildings in Ipswich and Roscoe.
Broadus, Powder River County, Mont.	27	4 p.m.	20	**440	0	0	5,000		Tornado	Cloud came from north-northeast then moved southward; unroofed building, carrying roof 50 feet into street; portion of roof driven through windshield of car.
Sherman County, Kans.	27	Evening	*1	3				$10,000	Hail and wind	Damaging hail southwest of Goodland and also north of Kanorado. Hailstones 1/4 inch in diameter driven by strong wind.
Pierson, Iowa	27	Evening					1,000		Wind	Destroyed barn.
Sioux City, Iowa	27	Evening					600		Electrical	House and contents damage.
Alton, Iowa	27						7,000		do	Destroyed 3 substation transformers.
Aurora, Ill.	27	6:30-6:45 p.m.	200	7	0	0	30,000	0	Tornado	Funnel cloud reported. Storm, moving northeastward, unroofed 8 homes, uprooted and damaged many trees, broke power and telephone lines, and did other miscellaneous damage.
Southeastern Decatur, northeastern Sheridan, Graham, and Rooks Counties, Kans.	27	6:50-8:30 p.m.						106,000	Hail and wind	Wind-driven hail in spotted areas damaged wheat.
Elk Point, Union County, S. Dak.	27	6:55 p.m.	Narrow	Short	0	0	5,000	0	Tornado	Personnel at Sioux City, Iowa, Weather Bureau observed formation and development of this tornado. Skipping action indicated in damage which hit 1 building in Elk Point. Cloud formation moved northeastward; 1 hour later considerable damage near Oyens, Iowa.
Storden (vicinity of), Cottonwood County, Minn.	27	7:30-8:15 p.m.	*6	15			5,000	10,000	Hail	Moderate to heavy hail that accompanied severe thunderstorm caused considerable damage to real property and to growing crops. Some hailstones reported about size of baseballs. Storm moved eastward.
Lowry, Pope County, and Mountain Lake, Cottonwood County, Minn.	27	P.m.			1		2,000		Electrical	Farmer killed by lightning near Lowry. Barn set afire after being struck by lightning and entirely destroyed near Mountain Lake.
Kingsley, Iowa	27	8 p.m.					3,000		do	Burned barn, contents, and livestock.
Oyens, Iowa	27	8 p.m.		3	0	0	20,000	Minor	Tornado	Destroyed buildings on 4 farms. Funnel clouds observed an hour earlier 30 miles southwest in vicinity of Sioux City.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Algona, Iowa	27	10 p.m.					$20,000		Thunderstorm	Hangar and 3 planes destroyed, display windows broken, trees downed, cars crushed, utility circuits out, and farm buildings destroyed.
Salina, Kans.	28	Early a.m.				1	Several thousand dollars	Slight	Wind, hail, and electrical	Hail, apparently most severe at airport, damaged fabric of several planes. In town gardens riddled and some roofs damaged. Workman knocked unconscious by lightning. Hail up to 1½ inches in diameter.
Coldwater, Comanche County, Kans.	28	3:15 a.m.			0	0	Slight	$0	Tornado (possible) and wind	Funnel observed hovering over city by 3 persons, but did not touch surface. Some tree damage from wind.
Adams County, Ill.	28	10:30 a.m.							Hail	Heavy damage to wheat and some damage to corn and soybeans in Cam Point area. Minor damage to buildings. Hailstones jagged, size of hickory nuts, with a few larger.
Arnot, Pa.	28	Afternoon				1			Electrical	Lightning struck tree, jumped to nearby house, burned boy standing on porch, damaged house wiring, and knocked some plaster from wall.
Lake of the Ozarks, Mo.	28	1:15 p.m.			0	0	150,000	0	Tornado	Storm struck resort area of Forthview, about 20 miles east of Warsaw, destroying or severely damaging 51 homes, 16 docks, several boats, and other facilities. Funnel cloud observed.
Lake of the Ozarks, Mo.	28	2:35 p.m.	Narrow	Short	6				Wind	Windsquall overturned excursion boat, with 13 aboard; occurred 3 miles west of Bagnall Dam.
Orleans Parish, La.	28	3:30 p.m.					25,000		Wind, rain, and hail	Garage roof collapsed, apparently due to weight of rain on roof, crushing truck and several cars. Hail widespread in New Orleans, but only slight damage.
Checotah (near), McIntosh County, Okla.	28	4:45-4:56 p.m.	100	**200	0	0	Minor	0	Tornado	Tornado hit along creek 3/4 miles northwest of Checotah and tore up a few trees. 1 barn unroofed. Funnel observed by many persons. Moved northeastward.
Newton County (northern portion), Ind.	28				0	0			Tornado	
Eureka (3 miles northwest of), Woodford County, Ill.	28	6:15-6:35 p.m.		Short	0	0	15,000	0	Tornado	Severe damage to 5 farms northwest of Eureka. 25 cars stalled on highway east of Metamora. Funnel cloud reported.
Woodford County, (western portion), Ill.	28	6:16-6:35 p.m.							Hail	Heavy property damage in Spring Bay and Metamora, with all windows on westsides of buildings at Spring Bay broken. Hailstones size of hen's eggs, a few large as oranges. Heavy loss to melon crop in Spring Bay area.
Henderson County, Ky.	28	Night					2,000	4,000	Electrical	Lightning struck and set fire to 2 barns and another farm building, destroying quantity of corn and a number of farm implements.
Bedford County, (northern portion), Pa.	28-29	Overnight							Rain	Heavy rains of cloudburst proportions on Brumbaugh Mountain sent flash floods down Gap Run and Potter Creek. At least a dozen small buildings carried away by flood. Many fields and several farm yards severely washed. At least 1 small bridge washed out.
Howard County, Ark.	29	12 midnight-12:25 a.m.	*5	30			50,000	450,000	Hail	Hail, marble to golf ball size, caused extensive damage over much of County.
Lawrence and Randolph Counties, Ark.	29	12:15-1:15 a.m.	*4	30			Minor	2,000	do	Hail up to ½ inch in diameter did not cover ground, but caused damage to a few windows and to soybeans and corn.
Sevier County, Ark.	29	4-4:15 a.m.	*3	4			300	700	do	Small, scattered hail in area around DeQueen, size of marbles.
Birmingham, Ala.	29	Afternoon					1,000		Electrical	Lightning struck in several places, causing considerable damage to power facilities; several power lines, supplying Birmingham and outlying areas knocked out, in some cases for 3½ hours.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Akron, Washington County, Colorado	29	3 p.m.					$2,000		Wind	Steel tank under construction damaged.
Fosston (vicinity of), Minn.	29	3:30 p.m.					12,000		Thunderstorm	Barn demolished. Storm moved southeastward.
Andrews, Andrews County, Tex.	29	5:22 p.m.			0	0	0	$0	Tornado	Pilot reported tornado touching ground 15 miles south-southwest of Andrews. Apparently caused no damage.
Pine Grove and Suedberg, Pa.	29	Evening			1		3,500		Electrical	Lightning struck and killed 1 man near Pine Grove, and knocked 2 other people down, but did not injure them. Near Suedberg, lightning killed 12 milk cows which had sought shelter under tree.
Burwell (6½ miles northeast of), Nebr.	29	11-11:30 p.m.					4,500		do	Home struck and burned with all furnishings.
Esbon (northeast of), Jewell County, Kans.	30	6 a.m.							do	Barn and contents burned.
Meade County (western portion), S. Dak.	30	Afternoon	*2				1,000		Hail	Hail size of golf balls struck small area. Damage confined to spring grains.
North Judson, Starke County, Ind.	30	5 p.m.					3,000		Wind and electrical	Barn, trees, and TV antennas damaged by wind. House damaged by lightning. About 80 percent wind damage, remainder lightning.
Long Prairie and St. Cloud (vicinities of), Minn.	30	5:45-9 p.m.	Narrow	80	0	0	35,000		Tornado (possible) electrical and rains	2 barns and a number of outbuildings demolished; barn moved from its foundation; buildings and antennas damaged; a number of trees uprooted; poles and wires down; some poultry perished. In southeastern portion of city of St. Cloud a large building unroofed and huge smokestack toppled in windstorm that appeared to be weak tornado development about 6 p.m. Lightning and heavy rains which accompanied storm caused some additional damage to real property and growing crops. Storm moved eastward, path not continuous.
Ogilvie, Kanabec County, Minn.	30	P.m.					6,000		Electrical	Farm home set afire by lightning and entirely destroyed.
Gray County (southern third), Kans.	30	6:10 p.m.	*4	28				200,000	Hail	Damage to wheat.
North-central Platte County to southwestern Wayne County, Nebr.	30	8-9:45 p.m.	400	33	6	16	450,000	Minor	Tornado	First hit southeast of Newman Grove; moved toward Norfolk. Struck 3 farms 10 miles southeast of Norfolk where all of the deaths and most of the injuries occurred.
Northern Nemaha and Brown Counties, Kans.	31	4:45 a.m.	*1/4-1/2	5-6			75,000	50,000	Hail	From just south of Sabetha in Nemaha County northeastward into Brown County, hailstones from golf ball size to 3 inches in diameter damaged windows, roofs, and sidings in Sabetha, and beat down crops in rural areas.
Shawnee County, Kans.	31	5 a.m.	*1	30			5,500	20,000	Wind and hail	Damage to hangar and light planes at local airport, and farm buildings, trees, and crops in strip from near Auburn northeastward to just west of Topeka. Property damage from wind $5,500; crop damage from hail $20,000. Moved northeastward.
Minnesota, southeastern portion	31	A.m.					25,000		Electrical	Residence partly destroyed by fire after being struck by lightning in Minneapolis. 2 farms in Elgin-Utica area struck by lightning and large barn, machine shed, and other small buildings entirely destroyed.
Kalamazoo, Mich.	31	7-8 a.m.					10,000		do	Barn struck by lightning and burned.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Ada (3 miles east of), Mich.	31				1	3			Electrical	Lightning struck large tree which then fell on car containing family of 4. Man was killed and his wife and 2 children injured.
Benton Harbor, Mich.	31				1				do	Man struck by ball of lightning while sitting in his home.
Grand Rapids, Mich.	31						$5,000		do	Lightning and resulting fire damaged garage and 2 trucks within.
Jackson, Mich.	31								Wind	Strong winds blew down house and garage.
South Haven (near), Mich.	31					1	10,000		Electrical	Lightning and resulting fire destroyed barn, 2 cows, and 250 chickens. Man injured at South Haven.
Three Rivers (3 miles west of), Mich.	31						13,000	$0	do	House burned to ground after being struck by lightning.
Sharonville (near), Mich.	31								Wind	Roof and side of large chicken house damaged. Many chickens killed.
Illinois, central portion	31	Afternoon and night							Hail	Damaging hailstorms reported in Schuyler, Fayette, and Richland Counties, while light hail fell in many other places in central Iowa. Crop damage severe, especially to wheat in Schuyler County. At Olney heavy damage inflicted on greenhouses.
Milwaukee and vicinity, Wis.	31	Afternoon			2	1			Wind and electrical	Series of thunderstorms moved through Milwaukee area, with winds observed at 60 m.p.h. at Milwaukee Weather Bureau. 2 deaths and injuries in Milwaukee. Electrical wires and many trees broken and blown over. Lightning struck 2 homes in Wauwatosa, just west of Milwaukee, doing $1,550 damage.
Northeastern Saline, southeastern Ottawa, and western Dickinson Counties, Kans.	31	Midafternoon	*2	10			20,000	80,000	Hail	Small grain losses in path of hail averaged more than 50 percent, with range of 25 percent to total.
Indianapolis, Marion County, Ind.	31	2 p.m.			0	0	300	0	Tornado	Small funnel-shaped cloud observed. Tree picked up and dropped on truck.
Atchison and Nodaway, Counties, Mo.	31	2:45-3:15 p.m.	440	20	0	0	20,000	0	Tornado, rains, and hail	Funnel cloud seen by several persons. Tornado moved from 4 miles south of Tarkio to short distance northwest of Burlington Junction. Damage to buildings on 8 farms; 1 bull killed; trees stripped. Heavy rains and hail reported in southeastern Nodaway County.
Garnett (10 miles southwest of), Anderson County, Kans.	31	2:50 p.m.			0	0	0	0	Tornado	Funnel cloud moving northeastward observed by pilot 5 miles west of small town of Welda, touching ground in open fields at 1/4-mile intervals.
Iriquois County (western portion), Ill.	31	3:15-3:45 p.m.	400	23	0	2	60,000	0	do	Damage intermittent on long path from 4½ miles west of Delrey to 1 mile south of Chebause. Severe damage on 10 farmsteads, 7 in Clifton area, and 1 building in Clifton. Extensive damage in and near Onarga and Clifton. Livestock suffered, with 3 hogs killed and 6 cows injured. Funnel cloud not observed.
Neosho and Bourbon Counties, Kans.	31	3:30 p.m.	220	50	0	0	66,000		do	In hit and skip fashion tornado damaged buildings at 3 miles west of Thayer, 3 miles north-northeast of Thayer, 3 miles west of Stark (all in Neosho County), Hiattville vicinity, and west edge of Ft. Scott. Greatest damage, including homes as well as barns near Hiattville in southwestern Bourbon County. Very likely 2 and possibly 3 funnels. Moved northeastward.
Sumner County, Kans.	31	4 p.m.	*1	4					Hail	From 6 percent to 20 percent loss to wheat near center of County.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Newton County, Ind.	31	4 p.m.			0	1	$26,300	$0	Tornado	Numerous barns and other buildings damaged or destroyed. Area affected was north of Kentland and in Brook and Morocco Communities.
Olathe (6 miles east of), Johnson County, Kans.	31	4:10 p.m.	Narrow	2	0	0	7,000	0	do	Damage to barns and sheds on 4 farms in north-northeastward path; funnel observed.
South Bend, St. Joseph County, Ind.	31	4:15 p.m.					6,000		Electrical and wind	$1,000 damage to TV antennae, trees, etc., by wind. $5,000 damage caused when barn destroyed by lightning. Storm moved northeastward.
Vernon County, Mo.	31	4:20 p.m.	Narrow	Short	0	0	20,000	0	Tornado	Damage to 10 farmsteads near and northeast of intersection of Drywood Creek and Highway 54. Homes only slightly damaged, but barns and outbuildings destroyed or severely damaged. Trees uprooted.
Bunker Hill (1 mile south of), Miami County, Ind.	31	P.m.					6,000		Electrical	Large barn destroyed by lightning.
Huntington and vicinity, Huntington County, Ind.	31	P.m.					2,000		Wind	Dozens of trees toppled over by wind, 3 plate-glass windows blown out, TV antennas bent, etc.
Columbia City and vicinity, Whitley County, Ind.	31						2,400		do	Outbuildings unroofed, 1 house roof damaged, TV antennas and electrical lines downed.
Decatur, Adams County, Ind.	31	P.m.					5,000		Electrical	Lightning burned out a number of power line transformers.
Lacrosse, LaPorte County, Ind.	31				1		1,000		Wind	Car plowed into tree, blown directly in its path. Driver killed.
Logansport, Cass County, Ind.	31	P.m.					1,000		Wind and electrical	Utility lines damaged by falling limbs and lightning. Damage about 40 percent by lightning, remainder by wind.
Indianapolis and vicinity, Ind.	31	P.m.				2	2,000		do	Power line damaged by wind and lightning. 2 persons knocked unconscious by lightning. About 10 percent of damage by lightning, remainder by wind.
Rochester and vicinity, Fulton County, Ind.	31						14,000		Wind	2 barns and other outbuildings destroyed. Part of gymnasium at nearby Gilead damaged.
Warsaw, Kosciusko County, Ind.	31	P.m.					1,500		do	Barn and other outbuildings damaged by wind. Plate-glass store window blown in.
New Carlisle, St. Joseph County, Ind.	31						3,000		Electrical	Barn destroyed by lightning.
Ft. Wayne and vicinity, Allen County, Ind.	31	P.m.					1,000		Wind and electrical	Electric line and poles blown down. TV set and 2 homes damaged by lightning. About 50 percent of damage by wind and 50 percent by lightning.
Walworth County, Wis.	31	P.m.					61,000		Electrical and wind	Lightning struck 2 barns near Whitewater; resulting fire destroyed both barns. Miscellaneous farm equipment destroyed. Estimated damage and loss $60,000. High winds with lightning struck City of Lake Geneva, blowing over trees and damaging several automobiles to extent of $1,000. Winds at Lake Geneva observed as high as 72 m.p.h.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Greenville, Hunt County, Tex.	31	P.m.							Wind	Numerous trees blown down; roof of barn torn off; hood of auto torn off and blown 300 yards; TV antennas bent.
Camden, Ala.	31	P.m.				1			Electrical	Boy struck by lightning while sitting on kitchen sink in his home; he was quickly revived.
Bangor to Grand Junction, Mich.	31	5-7 p.m.	3,500	10	0	0	°$500,000		Tornado and electrical	From point 4 miles west of Bangor to near Grand Junction, 40 barns and other buildings destroyed or damaged, hundreds of trees uprooted or snapped off, rural roads blocked, power and telephone lines broken, and many orchards damaged. Severe lightning and thunder accompanied storm. Moved northeastward.
Hopkins (near), Mich.	31	5-5:30 p.m.					15,000		Wind	Severe thunderstorm, moving northeastward, damaged several buildings.
Allegan (5 miles east of), Mich.	31	5:10-5:17 p.m.	110	1/4	0	0	3,450	$100	Tornado	Roof of barn lifted over house and deposited on tree which was crushed. 5 big elms blown down and parts of barn found 1/4 mile away.
Madison County, Ark.	31	5:30-6 p.m.	880	½				1,500	Hail	Hail, 1/4 to 1/2 inch in diameter.
Iowa, southern portion	31	Evening				1	100,000		Rain, wind, and electrical	Damaged buildings and other property, flooded highways and lowlands, disrupted utilities, damaged bridges and culverts, burned barns and houses, downed trees, and smashed car.
Valparaiso (near), Porter County, Ind.	31	Evening					1,000		Wind	Trees and outbuildings damaged, with some minor damage to dwellings.
Chili, Miami County, Ind.	31	6:30 p.m.			0	0	3,200	0	Tornado	2 barns unroofed, crib overturned, trees down, etc.
Coldwater Lake, Mich.	31	6:45-7:15 p.m.	130	1/4	0	0	41,000	0	Tornado, electrical, and wind	Along north shore of Coldwater Lake, moving northeastward, high winds took off roof of 1 home and damaged several others. Funnel and roll-type cloud observed. Lightning and high winds caused most damage and extended to other parts of southern Branch County. Uprooted trees, clogged roads, and tore down power and telephone lines.
Carroll and Boone Counties, Ark.	31	7-7:30 p.m.	*1	5	0	0	5,500	500	Wind and tornado	Several persons reported observing tornado funnel aloft out of southwest at 7:50 p.m. over Harrison; no damage by tornado.
Scio (near), Mich.	31	7:45 p.m.			0	0		0	Tornado	Ripped off tool shed roof and doors; flattened 10 trees, 1 of which fell on house porch.
Detroit, Mich.	31	8:30-9 p.m.	20-100	1-3/4	0	0	3,000	0	Tornado, winds, and rain	Small tornado which did not reach ground, moved northeastward in an arc to right about 2 miles east of Detroit City Airport. Squall line brought high winds and heavy rain to area.
Morocco, Newton County, Ind.	31	9:30 p.m.					35,000		Wind	A number of houses damaged; barn flattened. Auto with 3 occupants pinned by large tree which hurtled through air.
Orleans Parish, La.	31	10-10:30 p.m.			0	0	0	0	Waterspout	Heavy waterspout over Lake Borgne never reached land; not connected to any thunderstorm. Several incipient "spouts" failed to develop.
Illinois, northern and central portions	31	10:30-11:30 p.m.				2			Wind	Severe wind squalls struck a number of communities, felling numerous trees which broke power and telephone lines, and causing minor property damage. Most extensive damage at Sheldon in Iroquois County and Brownstown and St. Paul in Fayette County. Minor damage reported at Rockford, Belvidere, Hooneston, Emden, Bloomington, and many rural areas. In Sheldon 2 persons injured by falling trees.

* Miles instead of yards.
** Yards instead of miles.
° Crop damage included with other property damage.

EASTERN NORTH PACIFIC HURRICANES AND TROPICAL DISTURBANCES FOR 1953

Only four well-developed tropical disturbances were reported in the eastern North Pacific during the 1953 season, all occurring off the west coast of Mexico. The longtime average number is six. Two of the disturbances had winds reaching hurricane force compared to an average of 2.4. Centers of all of the disturbances were between latitude 14° N. and 20° N. when first discovered, and none persisted as a distinct storm north of latitude 25° N. Paths followed by the storms were well within the area of normal storm tracks, but none reached land before dissipating. No reports have been received of damage or loss of lives at sea as a result of the storms of the 1953 season. A total of 42 advisories were issued by the Weather Bureau at Los Angeles for the benefit of ships in the area. The first storm of the season occurred late in August, although on the average at least two disturbances have been reported before the first of August. The last storm, the first week in October, closed the season at about the usual time, but storms have occurred as late as November.

Individual review of the storms of 1953 follow. Times are given in Pacific Standard (+8 Zone) Time. A synopsis of important features is given in the table, and the tracks (numbered chronologically), are given in the chart.

I. August 23-26. Weather along and off the west coast of Mexico was generally mild during the first half of August, with less than the usual number of summertime showers and squalls. No evidence of more than normal winds or unusual circulation was apparent until the 23d when some half dozen ships between latitudes 14° N. and 22° N. reported winds of Beaufort force 4 to 6 around a possible closed center near the Revilla Gigedo Islands, some 350 miles south of the southern tip of Baja California, Mexico. None of the reports were within 150 to 200 miles of the probable center. As reports continued to indicate a closed cyclonic circulation, although none were within 150 miles of the assumed position of the center and no wind speeds were over 28 m.p.h., the first advisory was issued at midnight of the 23d. The center was estimated to be at latitude 20° N., longitude 110° W., and about 300 miles south of La Paz, Baja California, Mexico, at that time. The storm moved north-northwestward at an average speed of about 9.3 m.p.h., reaching latitude 25.3° N., longitude 113.7° W., about 90 miles northwest of Magdalena Bay, Baja California, on the night of the 25th-26th before dissipating. During the course of the storm, few reports were received within 50 miles of the central position. Strongest winds were reported by the S.S. Red Canyon. The ship, moving southeastward, recorded light northerly winds at latitude 24.4° N., longitude 112.7° W., at 1 p.m. on the 24th. Winds increased and veered through northeast and east and were reported as southwesterly 46 m.p.h. at latitude 22.9° N., longitude 111.2° W., at 1 a.m. of the 25th. Lowest pressure was received from the S.S. Sirocco which recorded a barometric pressure reading of 981 millibars (28.97 inches), at latitude 22.2° N., longitude 112.° W., at 4 p.m. on the 24th. At the time of the report the Sirocco observed southerly winds Beaufort force 7 to 8.

There was direct evidence of activity from this storm north of the Magdalena Bay area, and the locally heavy showers and thunderstorms that occurred in Arizona from the 25th through the 29th may well have been a result of the unstable moist air flowing north and northeast from the dissipating storm.

II. September 9-10. Although reports from several ships on the route between the Hawaiian Islands and the Panama Canal indicated the possibility of an easterly wave west of the Revilla Gigedo Islands on the 7th and 8th of September, insufficient data were available to determine whether or not there was a closed cyclonic circulation or to locate a definite position for a center. On the afternoon of the 8th, the S.S. Thor Isle, southbound from California to the South Pacific, reported a fresh north-northeast wind, pressure falling, at latitude 24° N., longitude 125° W., about 700 miles southwest of San Diego, Calif. At 9 a.m. of the 10th at latitude 20° N., longitude 126° W., the wind was 30 to 40 m.p.h. and the barometer read 29.56 inches. At 4 p.m. of the 10th, the wind had shifted to west 40 m.p.h., and the barometer had risen to 29.72 inches. No other reports were received from the immediate vicinity of the storm, but during the next several days isobaric analysis over the Eastern Pacific indicated a northward movement of the depression, and on the 15th some very light showers occurred over central California, coastal, and mountain points.

III. September 13-16. This hurricane apparently developed off the west coast of Mexico, near latitude 18° N., longitude 108° W., on the 13th, as several ships reported east to southeast winds of 30 to 40 m.p.h. in the northeast quadrant of the storm. It travelled north-northwestward at about 5 m.p.h. until the 15th, and then recurved to the north-northeast at about the same speed, and dissipated in the mouth of the Gulf of California at about latitude 23° N., longitude 108° W., 120 miles west of Mazatlan, Sinaloa, Mexico, on the evening of the 16th. While no reports of damage were received by the Weather Bureau, numerous ships reported gale winds as the center crossed the steamer track between California and the Panama Canal, and the S.S. Syosset observed a maximum wind of 86 m.p.h. at 5 a.m. of the 15th at latitude 20.3° N., longitude 108.6° W., about 190 miles west of Cape Corrientes. Highest land station wind report was received from Mazatlan, where gusts of 45 m.p.h. occurred on the afternoon of the 16th. Lowest pressure reported during the hurricane was 29.06 inches, by the S.S. Bulk Star, at 4 p.m. of the 15th at latitude 20.9° N., longitude 107.5° W. There was locally heavy rain in the Mexican state of Sinaloa and showers eastward across Mexico following dissipation of this storm, but apparently no moisture reached the United States.

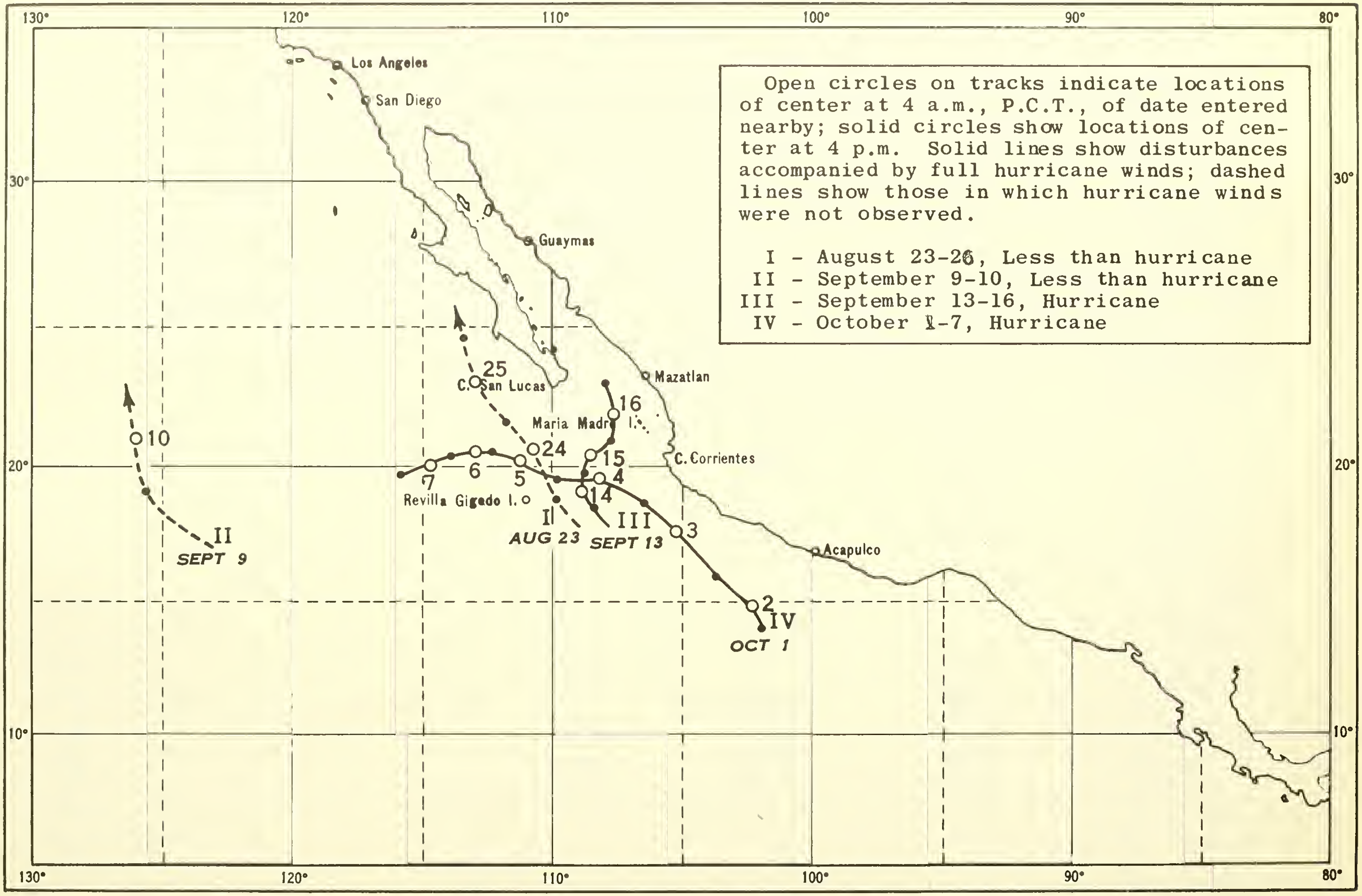
IV. October 1-7. This hurricane was first evident as a closed cyclonic circulation on the afternoon of the 1st following several days of squally weather in the Gulf of Tehuantepec and along the lower Mexican Coast. The center was estimated to be at latitude 14° N., longitude 102° W., about 250 miles southwest of Acapulco, Mexico, at 4 p.m. on the 1st. The storm moved northwestward at about 10 m.p.h. until the morning of the 4th and then westward at about 6 m.p.h. until it dissipated on the 7th. During the first 3 days of its progress, it was moving along the Panama Canal - California shipping track, and there were many reports of gales, heavy squalls, and heavy seas, mostly in the northeast quadrant of the storm. Strongest wind reported was 65 to 80 m.p.h. in heavy squalls by the M.S. Talleyrand at 1 p.m. on the 4th at latitude 19.3° N., longitude 109.5° W. Lowest pressure reported was 29.27 inches by the S.S. Gateway City at 2 p.m. of the 2nd at latitude 17.1° N., longitude 102.5° W. As the storm moved westward and dissipated well at sea, no effect was felt on the North American Continent.

HURRICANES AND TROPICAL DISTURBANCES

YEAR 1953

Storm number	Date	Area where first reported	Coast lines crossed	Highest wind speed reported	Lowest pressure reported	Place of dissipation reported	Intensity	Remarks
I	Aug. 23-26	Latitude 18.3° N., longitude 109.3° W., or about 350 miles west of Manzanillo, Mex.	None	47 m.p.h., by S.S. Red Canyon; 1 a.m., Aug. 25; latitude 22.9° N., longitude 111.2° W.	28.97 inches by Sirocco; Aug. 24; latitude 22.2° N., longitude 111.2° W.	Latitude 25.3°N., longitude 113.7° W., or 90 miles northwest of Magdalena Bay, Baja California, Mex.	Not of hurricane intensity	Did not touch land.
II	Sept. 9-10	Latitude 21° N., longitude 126° W., or about 1,000 miles southwest of San Diego, Calif.	None	40 m.p.h., by S.S. Thor Isle; 4 p.m., Sept. 10; latitude 19.3° N., longitude 126.3° W.	29.56 inches by S.S. Thor Isle; 9 a.m., Sept. 10; latitude 20.0° N., longitude 126.2° W.	Latitude 22° N., longitude 127° W., or about 1,000 miles southwest of San Diego, Calif.	Apparently not of hurricane intensity	Storm center determined from reports of only one ship. Did not touch land.
III	Sept. 13-16	Latitude 18° N., longitude 108° W., or about 250 miles southwest of Manzanillo, Mex.	None	86 m.p.h., by S.S. Syosset; 5 a.m., Sept. 15; latitude 20.3° N., longitude 108.6° W.	29.06 inches by S.S. Bulk Star; 4 p.m., Sept. 15; latitude 20.9° N., longitude 107.5° W.	Latitude 23° N., longitude 108° W., or 120 miles west of Mazatlan, Mex.	Hurricane	Did not touch land.
IV	Oct. 1-7	Latitude 14° N., longitude 102° W., or 250 miles southwest of Acapulco, Mex.	None	65-80 m.p.h. in heavy squalls by M.S. Talleyrand; 1 p.m., Oct. 4, latitude 19.3° N., longitude 109.5° W.	29.27 inches by S.S. Gateway City; 2 p.m., Oct. 2; latitude 17.1° N., longitude 102.5° W.	Latitude 20° N., longitude 116° W., or 400 miles southwest of Magdalena Bay, Baja California, Mex.	Hurricane	Did not touch land.

Tracks of Eastern North Pacific Hurricanes and Tropical Disturbances, 1953



Open circles on tracks indicate locations of center at 4 a.m., P.C.T., of date entered nearby; solid circles show locations of center at 4 p.m. Solid lines show disturbances accompanied by full hurricane winds; dashed lines show those in which hurricane winds were not observed.

I - August 23-26, Less than hurricane
II - September 9-10, Less than hurricane
III - September 13-16, Hurricane
IV - October 1-7, Hurricane

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

MAY 1954

The highest stage ever recorded was reached on the Kootenai River at Bonners Ferry, Idaho, during the last decade of May. In the upper Mississippi Basin the flooding was severe on the Chippewa River at Durand, Wis. Flooding elsewhere was mostly light.

ATLANTIC SLOPE DRAINAGE.--Rivers in Maine at the beginning of the month were at near normal levels. Almost continuous light rains during the first week of the month had little effect upon river levels but they saturated the ground and when heavy rains fell in the headwater area of the Saco on May 9, a slight overflow occurred along the entire length of the river. Damage was minor with a few flooded basements. The Androscoggin crested with a peak flow of 41,000 cubic feet per second at Gulf Island on the 11th with no damage. The Kennebec and Penobscot did not approach flood stage.

Little or no damage resulted from the overflow in the Merrimack River Basin from heavy rains on the 9th and 10th. Overflows were confined to meadows along the river banks and a few back-country dirt roads.

Although the snow cover over the Connecticut Valley at the end of March was below normal, moderate rains and snowmelt from the extreme northern part of the Valley caused rises above flood stage during April; and moderate to occasional heavy rains in May caused flood stage to be reached again with a high sustained flow throughout the month. Only minor damage resulted in the northern part of the Valley from the freshet.

Light overflow occurred on the Chemung River at Chemung, N. Y., on the 4th, due to heavy rain on the 2d and 3d. The precipitation was heaviest in the lower basin, averaging about 1.5 inches, while the basin above Corning, N. Y., averaged about 0.85 inch.

The flooding on Fishing Creek at Enfield, N. C., on the 22d and 23d was due to heavy rain from the 18th to the 21st. Rainfall averaged 2 inches along the upper Tar River Basin and 1.45 inches along the lower reach. No damage resulted.

EAST GULF OF MEXICO.--Except for those on the Oostanaula River during January, no flood stages were reached in the Alabama River Basin during the first 5 months of 1954. In Alabama, all streams have been at exceptionally low stages. May was the fifth consecutive month with precipitation below normal, the driest similar period perhaps since 1898. Most stations in Alabama from Montgomery southward have received less than 50% of normal rainfall during the 5-month period.

Flash floods resulted from the excessive rainfall during the night of April 30 - May 1 over the upper reach of the Pearl River. Total precipitation at Jackson, Miss., was 4.19 inches; of this amount 3.86 inches fell between midnight and 3 a.m. Several families were evacuated by city authorities from the comparatively lowlands contiguous to the natural drainage creeks. Bridge approaches and bridge abutments suffered considerable damage, mostly in rural areas. There was some flooding of homes in the Jackson Garden Apartment area and on Jayne Avenue in West Jackson. Creeks were also briefly out of their banks in North and South Jackson. The flooding along the Pearl River was due to additional heavy rainfall on the night of May 2 - 3.

UPPER MISSISSIPPI BASIN.--Because of excessive rain on the 1st and 3d, severe flooding occurred from April 29 to May 8 on the Chippewa River. This flood nearly approached the volume of the September 1941 flood. The flow at Durand equalled 93,600 c.f.s., which was slightly lower than the 95,500 c.f.s. flow in 1941. Local flooding occurred on the Trempealeau River on the 3d, the heaviest damage being in the French Creek area, flowing into Trempealeau River. Minor flooding occurred on the Black River at Galesville, Wis., on the 4th, with little or no damage. A rapid rise occurred on Turkey River at Garber in northeastern Iowa from a stage of 6.8 feet on April 29 to 13.19 feet on May 3.

Flooding continued along the main stem of the Mississippi River at Aitkin, Minn., from April 13 to May 22. Overflows developed at Libby, Minn., on April 30 from additional heavy rains during that evening. The flood conditions at Aitkin, Minn., were augmented by moderate precipitation (rain and snow combined) during the first 3 days of May. Though the soil was saturated, runoff was slow as snow blanketed the drainage area to a depth of 4 to 6 inches. The peak at Aitkin was lessened considerably as several subfreezing days followed the snowfall with afternoon temperatures reaching not over freezing. The heavy flow at Durand, Wis., in the Chippewa coupled with the moderately heavy flow from the St. Croix and the extreme upper Mississippi above St. Paul, Minn., produced flood stage in the main channel below Red Wing, Minn. Since there was almost exact synchronization of all tributary crests from above Guttenberg, Iowa, a near-major flood developed.

MISSOURI BASIN.--The Yellowstone River reached near bankful stage between Livingston and Billings, Mont., on the 22d and 23d due to low-level snowmelt during the unseasonably warm period of May 10 to 20.

Heavy rains on the 30th and 31st over the North Fork drainage in Nebraska resulted in overflows along the North Fork at the Elkhorn River on the 31st and the beginning of June.

Light flooding was reported at several widely scattered points on the 2d, 3d, 20th, and 28th, mostly along the outer tributaries of the Missouri.

WHITE BASIN.--General heavy showers during the closing days of April and early May caused sharp rises in the streams in the White Basin. Minor flooding resulted on the Black, Little Red, and White Rivers with no damage.

ARKANSAS BASIN.--Minor flooding occurred in several streams in the Arkansas Basin due to the heavy rains (4 to 7 inches) between April 29 and May 2. Minor damage occurred to crops and bridges along the lower portion of the flood plains.

RED BASIN.--The flooding on the Saline, Ouachita, and Little Rivers during the first decade of the month was minor and resulted from heavy showers during the end of April and the beginning of May.

The rainfall that produced flooding on the Sulphur River in Texas fell mostly on the 9th, 10th, and 11th. It was heaviest along the north slope of Sulphur Basin on the 9th and 10th. Much of the Sulphur Basin received between 3 and 4 inches during the 3-day period. Very little damage resulted because the flooded areas were mostly pasture lands.

LOWER MISSISSIPPI BASIN.--Minor flooding occurred on the St. Francis River at Fisk, Mo., on the 5th and 6th due to moderate rains on the 2d and 3d. No damage was reported.

WEST GULF OF MEXICO DRAINAGE.--The flooding in the West Gulf of Mexico streams during the first decade of the month was due to moderate-to-heavy general rains beginning on April 30. During May 1 to 3 these rains varied from 1 to 3 inches across the upper Sabine and from 3 to 12 inches across the middle Sabine and northern Louisiana streams.

The Sabine overflowed slightly at Mineola, Texas, from the 17th to the 21st due to general rains which averaged 2.5 inches over the basin from the 11th to 12th.

COLUMBIA BASIN.--The highest stage ever recorded was reached on the Kootenai River at Bonners Ferry, Idaho, between the 19th and 28th. This year, as in 1948, a heavy snowpack was suddenly released under the influence of an unseasonable heat wave. The snowpack this year was one of the heaviest of record. The Kootenai did not begin active rising until early in the second week of May. Afternoon temperatures during the period of May 16 to 20 rose to the upper 80's and the lower 90's over much of the Upper Columbia Basin, raising the freezing level to near 15,000 feet and causing rapid snowmelt at all levels. The area inundated this year was about 8,000 acres compared to 30,000 acres in 1948. The damages were estimated at 1-1/4 million dollars.

There was some minor flooding on the Clearwater River at Kamiah, Idaho, between the 19th and 21st.

Flooding developed along the main stem of the Columbia at Vancouver, Wash., on the 20th and along the Willamette at Portland, Oreg., on the 22d. These streams were rising and in flood as the month ended.

FLOOD STAGE DATA

Table 5

(All dates in May unless otherwise specified)

MAY 1954

River and station	Flood stage	Above flood stages -dates		Crest •	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE	Ft.			Ft.	
Bakers: Rumney, N. H.	7	9	9	7.4	9
Pemigewasset:					
Woodstock, N. H.	9	9	9	10.1	9
Plymouth, N. H.	11	9	10	13.4	9
Merrimack:					
Concord, N. H.	12	11	11	12.7	11
Manchester, N. H.	7	10	12	7.9	11
Lawrence, Mass.	20	11	11	20.1	11
Connecticut:					
White River Junction, Vt.	18	19	27	20.0	25
Hartford, Conn.	16	18 12	27 13	18.8 16.6	20 12
Chemung: Chemung, N. Y.	12	4	4	13.0	4
Fishing Creek: Enfield, N. C.	14	22	23	#15.3	23
EAST GULF OF MEXICO DRAINAGE					
Pearl:					
Jackson, Miss.	18	2	17	23.2	13
Bogalusa, La.	15	5	22	17.7	16
MISSISSIPPI SYSTEM Upper Mississippi Basin					
Chippewa: Durand, Wis.	11	Apr. 29	8	15.4	3
Trempealeau: Dodge, Wis.		2	5	7.35	3
Black: Galesville, Wis.	12	4	4	12.3	4
Turkey: Garber, Iowa	11	1	4	13.2	3
Mississippi:					
Libby, Minn.	13	Apr. 30	6	13.9	5
Aitkin, Minn.	12	Apr. 13	22	14.7	7
Red Wing, Minn.	14	6	6	14.0	6
Reads Landing, Minn.	12	4	9	13.5	6
Winona, Minn.	13	4	12	16.25	7
La Crosse, Wis.	12	4	13	14.3	7
Prairie du Chien, Wis.	18	9	12	18.7	11
Guttenberg, Iowa	15	8	15	17.3	11
Cassville, Wis.	17	9	14	17.9	12
Dubuque, Iowa	17	8	17	20.15	12
Bellevue, Iowa	17	11	15	17.6	13
Sabula, Ill.	16	11	17	17.3	14
Clinton, Iowa	16	11	19	18.2	14
Davenport, Iowa	15	13	17	15.5	15
Fairport, Iowa	14	11	20	16.1	15-16
Muscatine, Iowa	16	12	19	17.5	16
Keithsburg, Ill.	12	11	21	13.6	16
Hannibal, Ill.	16	19	19	16.0	19
Clarksville, Mo.	23	15	23	24.6	19-20
Winfield, Mo.	23	15	24	24.7	20-21
Missouri Basin					
Prairie Dog Creek:					
Woodruff, Kans.	12	20	20	•12.5	20
Solomon: Alton, Kans.	12	28	28	13.4	28
Little Blue: Endicott, Nebr.	9	2	2	9.1	2
Grand: Sumner, Mo.	26	3	4	27.7	3
Chariton: Novinger, Mo.	20	3	3	22.25	3
Marais des Cygnes:					
Trading Post, Kans.	25	3	3	25.15	3
White Basin					
Black: Black Rock, Ark.	14	3	5	17.6	5
Little Red: Judsonia, Ark.	30	4	5	33.6	5
White: Clarendon, Ark.	26	10	12	26.1	11
Arkansas Basin					
Bird Creek: Sperry, Okla.	21	2	3	23.2	3
Verdigris:					
Independence, Kans.	30	2	3	36.65	3

River and station	Flood stage	Above flood stages -dates		Crest•	
		From—	To—	Stage	Date
MISSISSIPPI SYSTEM (Cont'd.) Arkansas Basin (Cont'd.)	Ft.			Ft.	
Verdigris: (Cont'd.)					
Claremore, Okla.	38	4	5	•38.10	4
Inola, Okla.	41.5	3	6	#43.1 #43.1	4 5
Neosho:					
Chanute, Kans.	20	2	2	23.5	2
Erie, Kans.	20	2	3	•25.45	2
Parsons, Kans.	24	3	4	25.2	4
Oswego, Kans.	17	2	5	•21.1	4
Commerce, Okla.	15	2	5	•18.0	4
Deep Fork: Dewar, Okla.	18	2	6	20.9	2,3
Canadian: Whitefield, Okla.	16.5	2	3	•17.2	2
Arkansas:					
Fort North, Ark.	22	3	4	22.5	3
Van Buren, Ark.	22	3	4	24.3	3
Dardanelle, Ark.	22	4	5	22.6	5
Red Basin					
Saline: Benton, Ark.	20	2	3	24.8	2
Ouachita:					
Arkadelphia, Ark.	17	2	4	23.3	3
Camden, Ark.	26	5	8	28.8	7
Little: Whitecliffs, Ark.	25	5	6	25.4	5
Sulphur: Naples, Tex.	22	13	24	29.5	15
Lower Mississippi					
St. Francis: Fisk, Mo.	20	5	6	20.2	6
WEST GULF OF MEXICO DRAINAGE					
Nezpique: Basile, La.	22	6	8	22.6	7
Calcasieu:					
Kinder, La.	16	3	9	21.85	5
Old Town Bay, La.	6	6	8	7.6	7
Sabine:					
Mineola, Tex.	14	17	21	15.7	20
Deweyville, Tex.	14	6	8	14.5	7
PACIFIC SLOPE DRAINAGE Columbia Basin					
Kootenai:					
Libby, Mont.	16	20	22	17.3	21
Bonners Ferry, Idaho	31	19	28	35.4	21-23
Flathead:					
Columbia Falls, Mont.	14	20	22	15.2	20
Clearwater: Kamiah, Idaho	14	19	21	14.6	21
Columbia: Vancouver, Wash.	15	20	••	-	-
Willamette: Portland, Oreg.	18	22	••	-	-

• Provisional
•• Continued at end of month
Highest stage reported, but not necessarily the crest

RADIOSONDE DATA

Average monthly values

Table 20

MAY 1954

Standard pressure surface (mb.)	ALBUQUERQUE, N. MEX. (834 MB.)				ATLANTA, GA. (981 MB.)				BISMARCK, N. DAK. (955 MB.)				BOISE, IDAHO (912 MB.)				BROWNSVILLE, TEX. (1011 MB.)				BUFFALO, N. Y. (993 MB.)				BURRWOOD, LA. (1014 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,619	20.0	32	31	309	16.8	70	30	505	11.7	54	31	868	17.6	38	31	7	23.7	78	29	221	10.0	75	31	3	21.7	81
1000	31	20			31	140			30	112			31	65			31	103	23.3	76	29	124			31	122	21.4	77
950	31	482			31	583	17.5	59	30	548	10.4	42	31	517			31	555	20.6	75	29	559	10.9	56	31	575	18.6	69
900	31	960			31	1,041	14.2	59	30	998	10.0	48	31	978	18.8	31	31	1,017	19.7	61	29	1,002	7.5	60	31	1,028	16.0	66
850	31	1,457			31	1,521	11.1	61	30	1,470	6.3	52	31	1,465	15.4	30	31	1,509	18.1	48	29	1,470	4.1	64	31	1,512	13.5	59
800	31	1,980	18.1	30	31	2,025	8.2	58	30	1,963	2.7	55	31	1,974	11.2	34	31	2,026	16.0	42	29	1,960	.9	63	31	2,021	11.7	44
750	31	2,530	13.5	33	31	2,562	5.8	49	30	2,488	- .6	53	31	2,515	6.8	39	31	2,578	13.1	40	29	2,481	- 2.1	60	31	2,571	9.7	32
700	31	3,103	8.5	40	31	3,118	3.2	43	30	3,031	- 3.4	48	31	3,071	2.4	43	31	3,148	10.1	32	29	3,022	- 4.9	51	31	3,129	6.7	29
650	31	3,709	3.3	46	31	3,723	.2	43	30	3,622	- 6.4	45	31	3,672	- 1.7	42	31	3,763	5.8	34	29	3,609	- 7.7	45	31	3,736	3.3	29
600	31	4,353	- 1.9	51	31	4,354	- 3.5	44	30	4,235	-10.1	43	31	4,298	- 6.0	43	31	4,410	1.2	34	29	4,220	-11.1	41	31	4,378	- .7	29
550	31	5,034	- 7.4	55	31	5,039	- 7.8	38	30	4,906	-14.1	40	31	4,978	-10.5	40	31	5,103	- 3.9	33	28	4,889	-15.2	39	31	5,066	- 5.2	
500	31	5,772	-13.1	54	31	5,771	-12.3	34	29	5,622	-18.5	36	31	5,700	-15.5	39	31	5,849	- 8.8		28	5,599	-20.0	37	31	5,809	-10.0	
450	31	6,572	-19.0	51	30	6,582	-17.9	35	29	6,410	-24.0	32	30	6,488	-21.4	37	31	6,666	-14.3		28	6,378	-25.4		31	6,625	-15.5	
400	31	7,431	-25.4	43	30	7,442	-24.2	35	29	7,248	-29.7		30	7,341	-27.2	37	30	7,540	-20.8		28	7,217	-31.3	40	31	7,492	-21.8	
350	31	8,386	-32.8	37	29	8,398	-31.4		29	8,187	-36.6		30	8,289	-33.9	36	30	8,511	-28.1		28	8,149	-37.9		31	8,460	-29.2	
300	31	9,453	-40.7		29	9,470	-39.7		29	9,237	-44.3		30	9,352	-41.6		29	9,598	-36.6		28	9,193	-45.3		31	9,542	-37.6	
250	31	10,670	-49.5		28	10,691	-48.9		29	10,438	-51.6		30	10,565	-49.9		29	10,835	-46.0		28	10,392	-50.6		31	10,773	-47.2	
200	31	12,103	-57.6		28	12,125	-58.1		29	11,870	-55.0		29	11,999	-56.1		29	12,283	-56.8		27	11,838	-54.6		31	12,215	-57.3	
175	30	12,942	-59.5		28	12,959	-61.1		29	12,722	-54.9		29	12,845	-57.2		29	13,118	-61.8		27	12,692	-55.0		30	13,051	-61.4	
150	30	13,901	-61.6		26	13,899	-61.9		29	13,707	-54.8		29	13,818	-57.5		29	14,060	-66.5		25	13,666	-54.8		30	13,998	-64.8	
125	30	15,028	-62.8		26	15,023	-62.8		29	14,071	-55.1		28	14,970	-57.3		25	15,150	-69.7		21	14,809	-54.9		30	15,104	-66.8	
100	30	16,395	-64.1		24	16,387	-62.7		29	16,291	-56.2		27	16,373	-57.9		23	16,465	-72.2		16	16,219	-55.4		29	16,447	-68.4	
80	27	17,761	-63.9		22	17,768	-61.9		29	17,705	-56.8		27	17,778	-58.5		18	17,779	-70.3						24	17,792	-67.2	
60	24	19,531	-60.6		21	19,559	-58.4		26	19,521	-55.7		22	19,599	-57.3		17	19,515	-61.2						20	19,547	-61.6	
50	20	20,669	-58.1		19	20,713	-56.3		23	20,681	-54.5		20	20,756	-55.8		17	20,655	-57.9						20	20,684	-58.5	
40	15	22,082	-55.0		14	22,142	-53.5		19	22,111	-53.4		20	22,180	-54.3		15	22,075	-53.8						9	22,081	-55.2	
30	8	23,917	-52.2		9	23,982	-50.7		17	23,970	-52.0		12	24,052	-52.0		6	23,926	-50.4									
20									5	26,616	-49.9																	

Standard pressure surface (mb.)	CARIBOU, ME. (991 MB.)				CHARLESTON, S. C. (1013 MB.)				COLUMBIA, MO. (987 MB.)				DODGE CITY, KANS. (923 MB.)				EL PASO, TEX. (877 MB.)				ELY, NEV. (806 MB.)				GLASGOW, MONT. (939 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	191	8.4	77	31	13	17.9	85	31	238	15.0	64	31	792	14.3	70	31	1,195	24.5	24	31	1,908	15.4	34	31	648	12.7	51
1000	31	115			31	128	19.5	73	31	123			31	102			31	25			31	30			31	110		
950	31	545	7.4	70	31	575	17.8	62	31	562	15.0	57	31	544			31	494			31	489			31	551		
900	31	984	5.3	69	31	1,030	14.6	64	31	1,016	11.8	61	31	1,001	14.2	61	31	972			31	960			31	1,000	11.2	45
850	31	1,449	3.0	71	31	1,510	11.2	66	31	1,491	8.4	64	31	1,482	11.9	63	31	1,467	23.1	21	31	1,449			31	1,474	7.5	49
800	31	1,938	1.0	72	31	2,014	8.3	63	31	1,990	5.5	61	31	1,988	10.0	57	31	1,991	19.0	24	31	1,970	17.1	25	31	1,970	3.8	55
750	31	2,461	- 1.6	70	31	2,553	5.8	50	31	2,522	2.8	55	31	2,529	7.6	54	31	2,545	14.2	27	31	2,521	12.8	28	31	2,497	.3	57
700	31	3,001	- 4.5	65	31	3,107	3.4	41	31	3,071	.5	45	31	3,089	4.8	50	31	3,117	9.1	34	31	3,089	7.6	32	31	3,040	- 3.4	58
650	30	3,588	- 7.3	55	31	3,715	.2	38	31	3,669	- 2.6	41	31	3,693	1.2	49	31	3,728	4.0	39	31	3,698	2.2	39	31	3,630	- 6.5	52
600	30	4,201	-10.7	52	31	4,343	- 3.2	35	31	4,293	- 6.4	39	31	4,329	- 3.2	46	31	4,370	- 1.3	44	31	4,334	- 2.9	42	31	4,244	-10.1	49
550	30	4,871	-14.7	51	31	5,032	- 7.2	32	31	4,972	-10.8	37	31	5,013	- 8.1	46	31	5,058	- 6.6	44	31	5,018	- 8.3	47	31	4,915	-14.1	43
500	30	5,580	-19.3	49	31	5,763	-11.9	30	31	5,693	-15.6	37	31	5,745	-13.3	43	31	5,794	-11.8	40	31	5,750	-13.9	46	31	5,627	-18.8	44
450	30	6,364	-24.6	50	31	6,570	-17.4	32	31	6,488	-21.2	34	31	6,545	-18.8	39	31	6,601	-17.5	31	31	6,551	-19.6	39	31	6,414	-24.0	44
400	30	7,203	-30.5	45	31	7,433	-23.8	35	31	7,339	-27.5	32	31	7,407	-24.9	36	30	7,465	-23.6		31	7,407	-25.6	34	31	7,254	-29.6	44
350	30	8,137	-37.8		31	8,393	-31.0		31	8,284	-34.9		31	8,363	-32.1	36	30	8,427	-30.9		31	8,361	-32.7		31	8,191	-36.7	45
300	30	9,102	-45.2		31	9,467	-39.2		31	9,341	-42.9		30	9,436	-40.2		30	9,498	-39.2		31	9,428	-40.9		31	9,240	-44.4	
250	29	10,376	-51.9		31	10,688	-48.8		31	10,545	-51.6		30	10,653	-49.7		30	10,725	-48.5		31	10,643	-50.1		31	10,439	-51.2	
200	29	11,805	-55.9		31	12,121	-58.2		31	11,967	-58.5		30	12,083	-58.1		30	12,163	-57.2		30	12,068	-58.0		30	11,879	-54.8	
175	29	12,653	-55.8		31	12,953	-61.6		31	12,802	-60.0		30	12,918	-60.1		29	12,997	-60.2		30	12,904	-60.0		29	12,733	-53.9	
150	28	13,629	-54.9		31	13,902	-63.3		31	13,763	-60.0		30	13,876	-61.0		27	13,948	-61.9		30	13,865	-60.5		29	13,722	-53.6	
125	27	14,790	-55.1		30	15,018	-63.5		31	14,901	-59.7		30	15,011	-60.1		27	15,068	-65.0		29	14,999	-60.7		29	14,893	-53.9	
100	27	16,209	-56.4		30	16,382	-64.2		30	16,289	-60.6		26	16,394	-60.8		24	16,420	-65.8		29	16,387	-60.9		26	16,326	-55.0	
80	26	17,625	-57.0		29	17,749	-63.1		30	17,678	-60.2		26	17,778	-60.8		23	17,775	-65.0		27	17,763	-61.1		24	17,742	-55.8	
60	22	19,460	-55.7		27	19,535	-58.8		26	19,484	-58.2		22	19,569	-58.6		20	19,539	-61.3		23	19,556	-58.7		19	19,578	-54.6	
50	20	20,617	-55.0		24	20,683	-56.5		21	20,631	-56.1		19	20,725	-56.3		18	20,681	-57.6		21	20,702	-56.6		17	20,744	-54.0	
40	16	22,040	-53.9		21	22,099	-54.7		18	22,054	-53.4		15	22,163	-53.4		18	22,100	-54.3		17	22,130	-54.6		11	22,200	-53.2	
30	11	23,904	-52.7		17	23,953	-51.6		9	23,936	-52.1		7	24,033	-50.8		11	23,950	-51.9		11	23,977	-52.0					

Standard pressure surface (mb.)	GRAND JUNCTION, COLO. (847 MB.)				GREAT FALLS, MONT. (886 MB.)				GREEN BAY, WIS. (908 MB.)				GREENSBORO, N. C. (984 MB.)				HATTERAS, N. C. (1015 MB.)				HILO, T. H. (1013 MB.)				INTERNAT. FALLS, MINN. (972 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,474	19.2	32	31	1,128	12.7	45	31	210	8.8	70	31	273	15.0	79	31	3	18.9	80	31	9	23.9	79	30	360	7.4	69
1000	31	19			31	90			31	113			31	132			31	129	18.6	74	31	128	21.9	79	30	122		
950	31	481			31	538			31	543	8.9	58	31	570	16.2	61	31	568	16.1	66	31	578	18.6	82	30	547	6.8	66
900	31	954			31	998			31	985	6.6	60	31	1,028	13.2	61	31	1,025	13.0	69	31	1,035	15.7	85	30	988	4.1	68
850	31	1,446	19.7		31	1,471	10.4	44	31	1,452	3.5	63	31	1,506	9.8	64	31	1,503	9.8	70	31	1,519	12.9	87	30	1,450	1.4	69
800	31	1,968	17.8	26	31	1,972	6.6	50	31	1,941	.6	59	31	2,007	6.4	66	31	2,004	6.9	65	31	2,027	10.3	85	30	1,937	- .9	69
750	31	2,520	12.7	31	31	2,503	2.5	57	31	2,460	- 2.5	57	31	2,540	3.0	65	31	2,540	3.8	58	31	2,576	8.8	75	30	2,453	- 3.5	63
700	31	3,087	7.6	37	31	3,052	- 2.0	62	31	3,001	- 5.5	50	31	3,089	- .1	62	30	3,087	1.0	49	31	3,134	6.3	57	30	2,993	- 5.0	56
650	31	3,695	2.5	41	31	3,640	- 5.8	61	31	3,583	- 8.1	46	31	3,687	- 2.9	54	30	3,686	- 2.0	40	31	3,746	3.9	41	30	3,576	- 8.5	52
600	31	4,333	- 2.8	47	31	4,261	- 9.6	53	31	4,197	-11.4	41	31	4,310	- 6.3	51	30	4,312	- 5.6	36	31	4,386	.5	42	30	4,188	-11.4	48
550	31	5,018	- 8.2	53	31	4,930	-13.6	49	31	4,862	-15.5	40	30	4,991	-10.2	47	30	4,996	- 9.5	34	31	5,082	- 3.7	44	30	4,851	-15.3	46
500	31	5,747	-13.9	51	31	5,646	-18.7	48	31	5,572	-20.3	42	30	5,714	-14.9	39	30	5,719	-14.1	32	31	5,826	- 8.3	36	30	5,564	-20.0	45
450	31	6,546	-19.7	44	31	6,428	-24.4	47	31	6,351	-25.7	37	30	6,511	-20.1	38	30	6,520	-19.6	33	31	6,648	-13.5	36	30	6,342	-25.5	46
400	31	7,402	-26.1	43	31	7,270	-30.6	48	31	7,188	-31.4	38	30	7,367	-26.0	38	30	7,375	-25.7		31	7,522	-19.7	35	30	7,181	-31.6	43
350	31	8,352	-33.7	43	30	8,201	-37.7	49	31	8,120	-37.8		30	8,319	-32.9		30	8,328	-32.7		30	8,500	-26.8	36	30	8,110	-38.7	
300	31	9,413	-42.1		30	9,247	-45.1		31	9,166	-44.6		30	9,385	-40.8		30	9,396	-40.3		30	9,592	-35.6		29	9,148	-45.5	
250	31	10,620	-51.1		30	10,444	-52.5		31	10,370	-50.1		30	10,600	-49.4		29	10,615	-49.1		30	10,832	-45.8		29	10,348	-50.1	
200	31	12,044	-58.2		30	11,869	-56.3		31	11,812	-54.0		30	12,037	-56.3		28	12,055	-57.8		30	12,279	-57.3		29	11,793	-53.0	
175	30	12,881	-59.6		30	12,718	-55.6		30	12,671	-54.6		29	12,877	-58.8		28	12,890	-60.6		30	13,111	-63.2		29	12,653	-52.9	
150	29	13,842	-59.8		30	13,700	-54.8		30	13,657	-54.5		29	13,841	-59.3		27	13,845	-61.1		28	14,050	-68.6		29	13,647	-52.6	
125	29	14,979	-60.1		30	14,861	-55.9		30	14,824	-54.8		28	14,983	-60.2		27	14,975	-61.5		26	15,136	-71.8		29	14,823	-53.0	
100	28	16,363	-61.5		30	16,279	-56.7		28	16,248	-55.9		28	16,374	-60.9		26	16,351	-62.0		21	16,444	-72.3		28	16,259	-54.4	
80	28	17,745	-61.2		29	17,685	-57.5		28	17,662	-57.3		27	17,761	-59.8		25	17,730	-60.9		18	17,764	-70.4		23	17,697	-55.8	
60	25	19,537	-58.5		28	19,504	-56.8		24	19,477	-55.7		26	19,569	-57.5		22	19,528	-57.4		16	19,489	-66.7		19	19,531	-54.6	
50	21	20,691	-57.1		28	20,662	-55.7		24	20,640	-54.9		25	20,723	-55.2		21	20,682	-55.0		14	20,595	-63.6		19	20,699	-53.7	
40	18	22,119	-55.3		23	22,088	-54.1		21	22,074	-53.7		19	22,155	-53.8		20	22,104	-53.8		12	21,982	-59.6		19	22,134	-52.9	
30	11	23,964	-52.7		21	23,946	-52.3		18	23,923	-52.3		9	24,010	-52.2		12	23,947	-51.4		8	23,804	-54.6		12	24,001	-51.5	
20					9	26,566	-49.9																					
15					5	28,497	-46.0																					

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Averags monthly values

Table 20—Continued

MAY 1954

Standard pressure surface (mb.)	LAKE CHARLES, LA. (1013 MB.)				LANDER, WYO. (827 MB.)				LAS VEGAS, NEV. (930 MB.)				LITTLE ROCK, ARK. (1005 MB.)				MAZATLAN, MEXICO (1008 MB.)				MEDFORD, ORE. (966 MB.)				MERIDA, MEXICO (1009 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	5	20.8	80	31	1,696	12.2	53	31	660	28.6	13	30	79	18.4	73	30	14	24.5	78	31	401	19.3	44	30	27	26.7	77
1,000	30	118	21.1	73	31	63			31	10			30	122	18.9	66	30	84	23.7	77	31	104			30	107	26.1	77
950	30	566	18.6	71	31	511			31	475			30	568	17.5	60	30	542	22.6	60	31	549	19.1	39	30	561	23.2	78
900	29	1,024	15.8	70	31	975			31	953	27.2	16	30	1,022	14.2	63	30	1,004	23.9	34	31	1,009	15.5	44	30	1,030	21.0	75
850	29	1,508	14.1	60	31	1,458			31	1,454	23.0	18	30	1,503	11.4	67	30	1,502	21.1	31	31	1,491	11.5	51	30	1,523	18.5	73
800	29	2,019	12.2	52	31	1,969	11.7	45	31	1,977	18.3	21	30	2,006	9.3	58	30	2,023	18.2	29	31	1,994	7.4	57	30	2,041	15.2	72
750	29	2,565	9.7	43	31	2,506	7.4	49	31	2,524	13.4	26	30	2,549	7.0	54	30	2,582	14.5		31	2,529	4.2	55	30	2,594	11.9	69
700	29	3,127	6.6	36	31	3,069	3.3	54	31	3,099	8.2	31	30	3,105	3.9	55	29	3,151	10.2		31	3,080	1.3	46	30	3,161	8.9	56
650	29	3,732	3.0	33	31	3,669	-1.0	57	31	3,704	3.2	34	29	3,710	.5	54	25	3,776	6.2		31	3,680	-1.4	36	20	3,778	5.6	46
600	29	4,375	-1.3	35	31	4,298	-5.5	56	31	4,349	-1.4	31	29	4,343	-3.1	50	24	4,416	1.9		31	4,308	-4.9	36	28	4,421	1.9	40
550	28	5,065	-5.6		31	4,976	-10.2	51	31	5,035	-5.8		28	5,031	-7.2	46	24	5,116	-2.6		30	4,985	-9.6	38	27	5,119	-2.1	
500	28	5,804	-10.6		31	5,702	-15.5	46	31	5,776	-11.2		26	5,762	-12.1		23	5,861	-7.6		30	5,710	-14.6	38	27	5,868	-6.3	
450	27	6,617	-16.2		31	6,493	-21.4	43	31	6,581	-17.5		26	6,570	-17.6		22	6,681	-13.1		30	6,509	-20.2	35	26	6,690	-11.7	
400	27	7,483	-22.5		30	7,340	-28.0	44	31	7,447	-24.2		24	7,436	-23.7		19	7,564	-19.5		30	7,362	-26.2		26	7,577	-17.7	
350	27	8,448	-29.8		30	8,284	-35.2	39	31	8,405	-31.8		23	8,399	-30.7		15	8,542	-26.8		29	8,311	-33.4		25	8,562	-24.6	
300	27	9,527	-38.3		28	9,356	-42.5		31	9,474	-40.4		23	9,475	-39.3		14	9,632	-35.4		29	9,376	-41.2		25	9,664	-32.9	
250	26	10,752	-47.8		28	10,561	-51.5		31	10,690	-49.8		23	10,697	-48.9		6	10,888	-44.9		29	10,590	-49.8		24	10,917	-43.1	
200	26	12,190	-57.2		27	11,989	-58.7		31	12,120	-58.3		23	12,131	-57.7						29	12,023	-57.6		23	12,380	-55.0	
175	26	13,027	-60.8		26	12,827	-60.3		31	12,953	-61.1		23	12,968	-60.3						29	12,861	-59.1		23	13,219	-61.4	
150	23	13,977	-63.9		26	13,788	-59.8		30	13,916	-62.9		22	13,929	-61.5						28	13,827	-58.0		21	14,155	-68.5	
125	21	15,091	-66.7		25	14,924	-59.0		29	15,036	-63.6		22	15,058	-62.1						26	14,976	-58.2		15	15,214	-73.6	
100	19	16,432	-68.1		23	16,324	-60.4		29	16,401	-64.2		21	16,442	-63.5						22	16,377	-58.6		7	16,504	-75.6	
80	19	17,776	-66.1		21	17,714	-60.3		27	17,767	-63.9		20	17,820	-62.5						20	17,781	-59.3					
60	19	19,537	-61.5		18	19,513	-58.8		26	19,538	-61.3		19	19,607	-59.0						16	19,579	-58.9					
50	18	20,677	-58.0		17	20,665	-57.4		24	20,678	-58.3		17	20,754	-56.6						13	20,732	-56.8					
40	15	22,091	-55.6		12	22,063	-56.1		23	22,094	-55.4		16	22,176	-54.3						9	22,163	-55.2					
30	9	23,922	-52.9		9	23,903	-54.7		19	23,937	-52.2		11	24,024	-51.8						7	24,005	-53.1					
20									9	26,580	-49.5		5	26,694	-48.9													

Standard pressure surface (mb.)	MIAMI, FLA. (1014 MB.)				MIDLAND, TEX. (913 MB.)				NANTUCKET, MASS. (1012 MB.)				NASHVILLE, TENN. (995 MB.)				NORTH PLATTE, NEBR. (916 MB.)				OAKLAND, CALIF. (1013 MB.)				OKLAHOMA CITY, OKLA. (968 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	4	25.3	78	31	871	21.1	51	31	14	9.7	90	30	177	16.2	76	31	849	12.4	68	31	6	14.5	70	31	391	17.0	78
1,000	31	126	24.7	76	31	67			31	115	11.2	79	30	133			31	99			31	112	13.4	71	31	112		
950	31	581	21.6	75	31	520			31	544	11.3	71	30	572	15.8	57	31	541			31	548	14.3	55	31	559	17.4	68
900	31	1,042	18.7	73	31	990	20.6	50	31	995	9.4	66	30	1,028	12.3	59	31	994	12.7	62	31	1,003	15.8	29	31	1,013	14.9	66
850	31	1,530	15.4	72	31	1,482	18.2	49	31	1,467	7.1	63	30	1,504	8.6	62	31	1,472	9.8	64	31	1,486	14.0	25	31	1,495	12.2	69
800	31	2,042	12.7	62	31	1,999	15.4	48	31	1,963	4.4	61	30	2,003	5.8	56	31	1,973	7.1	64	31	1,995	11.9		31	2,002	10.8	60
750	31	2,588	9.8	56	31	2,550	12.3	44	31	2,493	1.7	59	30	2,536	3.7	48	31	2,505	4.3	64	31	2,539	9.4		31	2,546	8.1	56
700	31	3,152	6.3	52	31	3,118	8.7	38	31	3,040	-1.1	54	30	3,086	.9	46	31	3,060	1.7	60	31	3,101	6.3	20	31	3,105	5.0	53
650	30	3,762	2.7	50	31	3,729	3.9	38	31	3,633	-4.5	51	30	3,683	-2.4	47	31	3,657	-1.8	60	31	3,706	2.7		31	3,708	1.1	50
600	30	4,398	-1.0	45	31	4,371	-1.1	41	31	4,254	-8.0	46	30	4,309	-5.9	41	31	4,286	-5.5	55	31	4,347	-1.6		31	4,344	-2.8	45
550	30	5,091	-4.7		31	5,064	-6.1	37	31	4,928	-12.1	43	30	4,989	-9.8	36	31	4,963	-10.1	50	31	5,031	-6.3		31	5,032	-7.7	44
500	30	5,832	-8.9		31	5,798	-11.2	33	31	5,647	-16.8	42	30	5,715	-14.3	34	31	5,691	-15.0	48	31	5,772	-11.6		31	5,762	-12.4	42
450	30	6,653	-14.1		31	6,609	-17.1	32	31	6,437	-22.2	37	30	6,516	-19.6	33	31	6,486	-20.6	42	31	6,576	-17.6	29	31	6,565	-18.0	40
400	30	7,525	-20.3	35	31	7,471	-23.6	31	31	7,287	-28.1		30	7,370	-25.8	38	31	7,340	-26.7	43	31	7,440	-24.5	35	31	7,427	-24.3	37
350	30	8,498	-27.3	36	31	8,432	-30.8		30	8,228	-35.0		30	8,323	-32.7		31	8,290	-33.8	40	31	8,398	-31.9	35	31	8,386	-31.6	36
300	29	9,590	-35.4		31	9,507	-38.8		30	9,285	-42.5		30	9,390	-40.6		31	9,353	-41.9		31	9,468	-40.2		31	9,457	-39.9	
250	29	10,831	-45.4		30	10,735	-48.0		30	10,495	-49.8		30	10,607	-49.2		30	10,559	-50.9		31	10,684	-49.9		31	10,676	-49.0	
200	29	12,279	-56.5		29	12,174	-57.1		29	11,938	-56.2		30	12,043	-57.1		30	11,986	-58.1		31	12,113	-58.5		31	12,109	-58.3	
175	29	13,114	-62.3		29	13,011	-60.4		29	12,783	-57.2		30	12,881	-59.9		30	12,824	-59.3		31	12,946	-61.0		31	12,943	-60.8	
150	27	14,055	-67.5		26	13,966	-62.0		29	13,756	-57.3		30	13,842	-60.2		30	13,789	-59.1		30	13,901	-61.5		29	13,903	-61.5	
125	26	15,141	-71.0		24	15,093	-63.2		29	14,908	-57.2		30	14,979	-60.2		30	14,934	-58.7		30	15,029	-62.1		27	15,032	-61.9	
100	23	16,450	-72.9		23	16,450	-65.5		26	16,317	-57.7		28	16,366	-60.4		28	16,339	-58.8		30	16,405	-62.5		25	16,409	-62.5	
80	21	17,761	-69.5		21	17,807	-64.5		25	17,722	-57.6		28	16,757	-59.8		28	17,736	-59.6		27	17,783	-62.6		21	17,772	-61.9	
60	19	19,498	-62.7		18	19,583	-60.3		24	19,544	-56.2		22	19,559	-57.2		24	19,438	-57.9		22	19,556	-60.8		17	19,574	-59.1	
50	17	20,630	-59.6		18	20,723	-57.9		23	20,702	-54.6		21	20,716	-55.4		21	20,694	-56.2		19	20,699	-58.0		14	20,720	-56.8	
40	14	22,045	-55.8		14	22,139	-55.0		19	22,121	-53.4		18	22,142	-53.4		17	22,121	-54.6		17	22,115	-55.2		8	22,143	-54.2	
30					8	24,010	-51.5		15	23,976	-52.0		13	24,010	-51.6		11	23,972	-52.1		13	23,971	-52.6					

Standard pressure surface (mb.)	OMAHA, NEBR. (979 MB.)				PHOENIX, ARIZ. (968 MB.)				PITTSBURGH, PA. (971 MB.)				PORTLAND, ME. (1012 MB.)				RAPID CITY, S. DAK. (903 MB.)				ST. CLOUD, MINN. (976 MB.)				SAN ANTONIO, TEX. (984 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	300	15.0	60	31	338	28.9	24	31	382	13.0	65	31	20	8.8	87	31	966	11.4	63	31	316	9.9	64	31	243	23.4	62
1,000	31	121			31	48			31	129			31	115	9.9	77	31	101			31	114			31	100		
950	31	558	14.4	52	31	508	28.9	19	31	566	12.7	58	31	545	9.2	69	31	544			31	548	9.8	58	31	554	21.5	65
900	31	1,011	11.1	56	31	985	25.0	19	31	1,015	9.7	59	31	988	7.5	69	31	997	10.4	59	31	990	6.6	61	31	1,016	18.5	70
850	31	1,485	8.0	60	31	1,481	20.8	20	31	1,486	6.4	62	31	1,457	5.3	72	31	1,473	9.5	60	31	1,456	3.4	65	31	1,505	15.9	65
800	31	1,962	4.7	63	31	2,000	16.4	23	31	1,980	2.9	63	31	1,950	2.5	72	31	1,973	6.1	65	31	1,946	.5	65	31	2,019	14.2	54
750	31	2,510	2.2	56	31	2,551	11.7	28	31	2,503	-.1	58	31	2,472	-.6	69	31	2,501	2.9	68	31	2,466	-2.1	63	31	2,571	11.8	43
700	31	3,061	-.4	47	31	3,116	7.1	32	31	3,050	-3.3	58	31	3,019	-3.3	63	31	3,055	-.3	67	31	3,007	-4.3	55	31	3,136	8.7	38
650	31	3,655	-3.5	41	31	3,725	2.8	30	31	3,638	-6.0	51	31	3,607	-6.2	53	31	3,646	-3.8	62	30	3,594	-7.4	50	31	3,745	4.8	36
600	31	4,279	-6.9	40	31	4,364	-1.1		31	4,256	-9.5	48	31	4,225	-9.7	55	31	4,273	-7.4	54	30	4,206	-10.9	47	31	4,392	.4	34
550	31	4,956	-11.1	39	31	5,055	-5.6		31	4,925	-13.7	46	31	4,893	-13.9	54	31	4,948	-11.7	49	30	4,872	-15.0	46	31	5,085	-4.4	32
500	31	5,679	-15.5	32	31	5,792	-10.7		31	5,641	-18.3	44	31	5,609	-18.6	49	31	5,669	-16.4	43	30	5,584	-19.5	41	31	5,828	-9.6	
450	31	6,474	-21.1	36	31	6,604	-16.7		31	6,426	-23.7	42	31	6,392	-24.1	45	31	6,458	-21.9	42	30	6,361	-24.9	41	30	6,649	-15.3	
400	31	7,325	-27.1	37	31	7,466	-23.5		31	7,269	-30.1	43	31	7,237	-30.4	45	31	7,309	-27.9	42	30	7,204	-30.8	41	30	7,517	-21.8	
350	31	8,272	-34.3	37	31	8,427	-31.2		30	8,198	-37.1		31	8,172	-37.6		31	8,254	-35.0	41	30	8,138	-37.8		29	8,486	-29.3	
300	31	9,331	-42.3		31	9,501	-39.4		30	9,247	-44.2		30	9,220	-44.7		31	9,311	-42.6		30	9,183	-45.1		29	9,568	-37.7	
250	31	10,539	-50.8		31	10,724	-48.5		30	10,451	-50.0		29	10,415	-51.6		31	10,517	-51.6		30	10,383	-51.0		29	10,798	-47.2	
200	29	11,969	-57.3		31	12,163	-56.9		30	11,890	-54.9		29	11,846	-55.4		31	11,940	-57.7		30	11,821	-54.4		28	12,246	-56.5	
175	27	12,802	-58.3		31	13,002	-59.5		30	12,740	-56.1		28	12,699	-56.0		31	12,780	-58.3		30	12,676	-54.2		28	13,084	-60.7	
150	25	13,764	-57.2		30	13,960	-61.9		29	13,711	-56.8		28	13,678	-55.7		31	13,751	-57.2		30	13,664	-54.1		28	14,034	-63.7	
125	22	14,908	-56.9		30	15,082	-63.8		25	14,867	-57.6		27	14,835	-56.0		31	14,903	-57.3		30	14,831	-54.8		26	15,142	-66.1	
100	20	16,314	-57.9		29	16,448	-65.1		20	16,256	-57.2		25	16,250	-56.9		31	16,311	-57.9		30	16,254	-55.9		24	16,486	-68.3	
80	18	17,710	-57.9		29	17,806	-65.2		15	17,633	-56.8		24	17,662	-57.5		29	17,711	-58.5		28	17,658	-56.7		19	17,829	-67.3	
60	16	19,523	-56.7		26	19,572	-61.1		12	19,455	-55.6		20	19,488	-55.4		26	19,520	-56.7		25	19,485	-55.3		17	19,585	-62.0	
50	16	20,682	-55.3		24	20,712	-57.7		12	20,607	-54.1		18	20,652	-54.2		21	20,682	-55.8		21	20,649	-54.4		17	20,721	-58.5	
40	13	22,114	-53.4		23	22,129	-54.4		11	22,039	-52.6		15	22,083	-53.8		15	22,110	-54.0		16	22,090	-53.3		12	22,123	-54.4	
30	5	23,976	-52.0		21	23,993	-51.5		6	23,905	-50.7		6	23,973	-51.9		9	23,967	-52.7		7	23,954	-51.6		8	23,973	-51.3	
20					9	26,614	-48.8																					

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

Standard pressure surface (mb.)	SAN JUAN, P. R. (1014 MB.)				SANTA MARIA, CALIF. (1005 MB.)				S. STE. MARIE, MICH. (988 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	19	25.2	83	31	71	12.8	79	31	221	5.8	76
1,000--	31	140	24.6	81	31	110	12.4	79	31	120		
950----	31	591	21.7	81	31	548	13.4	69	31	545	6.8	59
900----	31	1,057	19.0	78	31	999	17.0	36	31	984	4.6	62
850----	31	1,548	16.4	75	31	1,486	15.4	32	31	1,448	2.1	66
800----	31	2,062	13.8	69	31	1,997	12.7	27	31	1,935	- .7	66
750----	31	2,608	11.0	60	31	2,544	10.7	20	31	2,453	- 3.8	62
700----	31	3,177	7.9	56	31	3,108	7.7	19	31	2,990	- 6.7	57
650----	31	3,792	4.2	51	31	3,719	3.9		31	3,572	- 9.0	46
600----	31	4,433	.6	44	31	4,360	- .3	21	31	4,182	-12.5	44
550----	31	5,130	- 3.1	36	31	5,050	- 5.2		31	4,845	-16.7	46
500----	31	5,875	- 7.2	34	31	5,791	-10.6		31	5,551	-21.1	44
450----	30	6,701	-12.4	30	31	6,603	-16.6		30	6,325	-26.2	40
400----	30	7,578	-18.4	33	31	7,466	-23.6		30	7,162	-31.6	
350----	30	8,559	-25.5	34	31	8,426	-31.6		30	8,094	-37.8	
300----	30	9,657	-33.8		31	9,497	-39.9		30	9,140	-44.5	
250----	29	10,905	-43.9		31	10,717	-49.4		30	10,346	-49.4	
200----	29	12,364	-55.6		31	12,147	-58.3		21	11,762	-51.2	
175----	29	13,202	-61.8		31	12,981	-60.8		17	12,634	-50.7	
150----	29	14,140	-68.2		31	13,935	-62.4		17	13,637	-51.2	
125----	29	15,216	-73.8		30	15,053	-64.2		14	14,823	-51.4	
100----	27	16,505	-76.0		30	16,415	-64.9		10	16,269	-53.9	
80-----	25	17,798	-74.1		30	17,775	-64.7		5	17,715	-55.9	
60-----	24	19,508	-65.1		29	19,542	-61.2					
50-----	24	20,627	-61.7		27	20,683	-58.1					
40-----	22	22,020	-57.7		21	22,100	-54.7					
30-----	18	23,838	-54.8		12	23,946	-51.8					
20-----												

Standard pressure surface (mb.)	SPOKANE, WASH. (930 MB.)				SWAN ISLAND, W. I. (1011 MB.)				TACUBAYA, MEXICO (772 MB.)				TAMPA, FLA. (1014 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	722	15.1	45	31	10	26.7	84	27	2,306	17.3	60	31	9	22.4	77
1,000--	31	95			31	103	26.3	83	27	32			31	129	22.5	73
950----	31	534			31	555	23.1	82	27	499			31	581	20.3	68
900----	31	994	13.7	42	31	1,025	20.5	76	27	979			31	1,040	17.4	67
850----	31	1,472	9.9	45	31	1,518	17.9	69	27	1,474			31	1,526	14.4	66
800----	31	1,972	5.6	49	31	2,035	15.3	60	27	2,007			31	2,036	11.7	59
750----	31	2,496	1.5	53	31	2,587	12.3	53	27	2,561	15.5	56	31	2,586	9.5	45
700----	31	3,048	- 2.3	52	30	3,155	9.2	47	27	3,139	11.0	60	31	3,143	6.6	42
650----	31	3,633	- 5.8	48	30	3,769	5.4	52	27	3,757	6.1	68	31	3,756	3.2	40
600----	31	4,256	- 9.6	43	30	4,416	1.8	50	27	4,404	1.3	73	31	4,392	- .4	38
550----	31	4,921	-13.8	42	29	5,111	- 2.1	47	27	5,103	- 3.4	78	31	5,087	- 4.6	33
500----	31	5,640	-18.4	43	29	5,865	- 6.1	45	27	5,847	- 7.8	71	30	5,825	- 9.4	
450----	31	6,423	-23.6	46	29	6,689	-11.0	46	27	6,669	-12.7	61	30	6,641	-14.7	
400----	31	7,269	-29.2	46	29	7,578	-16.5	43	27	7,549	-18.6	57	29	7,513	-20.5	
350----	31	8,209	-36.0	47	28	8,567	-23.5	41	26	8,532	-25.2	49	29	8,487	-27.9	
300----	31	9,262	-43.4		24	9,676	-31.7		26	9,632	-33.2	44	28	9,574	-36.6	
250----	31	10,466	-51.1		24	10,939	-41.3		25	10,881	-43.9		28	10,810	-46.2	
200----	31	11,901	-54.9		23	12,412	-53.4		23	12,340	-55.6		28	12,257	-56.5	
175----	30	12,755	-55.1		23	13,257	-60.2		23	13,178	-61.9		28	13,094	-61.5	
150----	30	13,740	-55.0		21	14,197	-67.7		20	14,110	-68.9		26	14,033	-65.5	
125----	27	14,898	-54.6		19	15,274	-74.2		15	15,191	-74.1		24	15,138	-67.9	
100----	25	16,319	-55.4		15	16,551	-77.4		8	16,489	-76.2		23	16,465	-69.4	
80-----	22	17,734	-56.5		14	17,837	-74.0		6	17,786	-72.3		23	17,800	-67.2	
60-----	16	19,543	-55.6		10	19,539	-63.9						23	19,554	-61.6	
50-----	14	20,702	-54.9		10	20,663	-61.2						22	20,689	-58.5	
40-----	11	22,122	-54.0		10	22,055	-57.9						20	22,104	-55.4	
30-----	5	23,948	-52.7		10	23,887	-53.5						15	23,944	-52.5	
20-----					7	26,530	-47.5									

Standard pressure surface (mb.)	TATOOSH ISLAND, WASH. (1014 MB.)				WASHINGTON, D. C. (1005 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	31	9.8	84	31	88	14.3	72
1,000--	31	143	9.3	81	31	128	15.5	66
950----	31	572	7.9	69	31	569	14.5	61
900----	31	1,012	5.8	67	31	1,018	11.4	63
850----	31	1,478	3.0	66	31	1,493	8.1	68
800----	31	1,967	.9	56	31	1,991	4.6	72
750----	31	2,488	- 1.3	44	31	2,521	1.1	72
700----	31	3,031	- 4.0	40	31	3,066	- 2.1	70
650----	31	3,616	- 7.2	38	31	3,660	- 5.0	64
600----	31	4,232	-10.6	36	31	4,278	- 8.6	61
550----	31	4,899	-14.7	42	31	4,953	-12.5	53
500----	31	5,611	-19.6	45	31	5,669	-16.9	51
450----	31	6,392	-24.8	47	30	6,457	-22.3	47
400----	31	7,233	-30.4	50	30	7,302	-28.3	46
350----	31	8,168	-37.0	47	30	8,245	-35.3	51
300----	31	9,216	-44.3		29	9,292	-43.1	
250----	31	10,417	-51.4		29	10,500	-49.9	
200----	31	11,851	-54.7		29	11,941	-55.1	
175----	31	12,705	-54.4		29	12,789	-57.3	
150----	31	13,693	-53.7		28	13,763	-58.2	
125----	31	14,864	-54.2		28	14,909	-58.4	
100----	31	16,290	-55.3		27	16,311	-58.6	
80-----	31	17,711	-56.1		23	17,698	-58.5	
60-----	29	19,540	-56.2		22	19,514	-56.2	
50-----	28	20,701	-55.2		21	20,665	-55.0	
40-----	20	22,149	-54.1		19	22,095	-53.6	
30-----	16	23,991	-53.5		13	23,920	-52.1	

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20 *Air Force Data for January, 1954

Standard pressure surface (mb.)	DENVER, COLO. (830 MB.)				FT. WORTH, TEX. (1000 MB.)				OGDEN, UTAH (857 MB.)				RANTOUL, ILL. (992 MB.)				ROME, N. Y. (1000 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,661	0.1	55	30	178	7.5	73	13	1,450	- 1.4		31	227	- 1.9	78	31	146	- 7.4	69
1,000--	31	128			30	175	3.6	69	13	200			31	165	- 6.4		31	151	-10.3	
950----	31	559			30	604	7.6	64	13	624			31	577	- 2.6	75	31	554	- 7.9	75
900----	31	1,002			30	1,044	8.5	59	13	1,058			31	1,001	- 2.7	68	31	970	- 8.0	75
850----	31	1,465			30	1,517	8.6	50	13	1,517	.5		31	1,455	- 1.8	56	31	1,414	- 8.4	73
800----	31	1,959	4.0	41	30	2,017	7.1	41	13	2,002	- 1.0		31	1,937	- 1.9	51	31	1,883	- 8.7	66
750----	31	2,484	1.3	38	30	2,552	4.6	38	13	2,517	- 4.3		31	2,455	- 4.0	47	31	2,388	-10.1	62
700----	31	3,031	- 2.2	39	30	3,104	1.6	37	13	3,054	- 7.6		31	2,991	- 6.6	43	31	2,912	-11.9	55
650----	31	3,618	- 6.4	43	30	3,699	- 2.1	35	13	3,631	-10.8		31	3,574	- 9.6	41	31	3,482	-14.6	53
600----	31	4,235	-10.9	43	30	4,328	- 6.4	35	13	4,237	-14.1		31	4,180	-13.2	40	31	4,078	-17.5	46
550----	31	4,899	-15.1	42	30	5,005	-11.0		13	4,895	-18.4		31	4,840	-17.4	41	31	4,726	-21.7	47
500----	31	5,612	-20.1	39	30	5,728	-16.2		13	5,596	-22.8		31	5,545	-22.3	38	31	5,419	-26.2	45
450----	31	6,384	-25.9	38	30	6,525	-21.6		13	6,365	-28.2		31	6,314	-27.8		31	6,175	-31.7	
400----	31	7,225	-32.6		30	7,371	-27.4		13	7,193	-34.2		30	7,144	-33.7		31	6,993	-37.8	
350----	30	8,143	-40.4		30	8,316	-34.7		13	8,112	-41.4		30	8,066	-40.4		31	7,901	-43.8	
300----	29	9,174	-48.4		30	9,373	-42.7		13	9,140	-49.3		30	9,099	-47.4		31	8,922	-49.7	
250----	28	10,349	-55.9		27	10,593	-50.7		13	10,318	-55.2		28	10,280	-54.8		30	10,105	-54.4	
200----	21	11,753	-61.3		24	12,024	-59.2		11	11,718	-57.5		26	11,697	-58.6		27	11,523	-57.0	
175----	15	12,586	-59.9		21	12,855	-61.4		9	12,576	-55.8		24	12,532	-57.5		26	12,373	-56.0	
150----	11	13,522	-57.9		17	13,817	-62.0		8	13,560	-56.8		19	13,515	-58.5		21	13,371	-56.3	
125----	6	14,656	-60.7		15	14,939	-65.5		7	14,702	-59.2						15	14,523	-57.0	
100----					9	16,286	-68.4										7	15,920	-57.4	

* February data for the above Air Force stations will be included in the June issue of this publication.

Note: All observations scheduled at 0300, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Table 21

MAY 1954

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	29	136	3.1	31	214	3.1	29	39	1.3	31	358	1.4	31	321	3.8	31	112	6.1
500	--	---	----	--	---	----	--	---	----	--	---	----	--	---	----	31	130	6.5
1,000	29	156	3.8	--	---	----	--	---	----	29	329	2.6	31	314	3.8	27	146	4.7
1,500	29	172	3.6	--	---	----	29	5	1.1	28	307	2.7	31	297	3.2	19	177	2.1
2,000	23	206	4.4	31	226	3.6	28	281	1.0	26	299	3.3	31	284	2.8	14	245	1.9
2,500	21	237	5.8	31	235	3.5	24	276	2.9	23	297	4.2	30	279	3.4	12	261	4.1
3,000	20	255	7.5	31	246	3.9	22	279	5.9	18	309	7.9	29	273	4.9	12	264	4.2
4,000	18	275	9.1	30	257	4.0	16	271	9.6	17	312	12.8	28	259	7.6	10	292	8.2
5,000	17	277	10.8	29	271	7.1	14	280	12.8	11	304	13.8	25	264	9.6			
6,000	17	285	12.1	29	275	7.6							22	277	11.1			
8,000	15	285	12.9	23	276	10.0							19	286	14.3			
10,000	10	293	17.3	14	281	13.4							13	290	20.6			
12,000				10	305	15.0												
14,000																		
16,000																		

Altitude (meters) m.s.l.	* Buffalo, N. Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S. C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)			Ely, Nev. (1,910 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	275	2.0	31	332	1.6	29	222	2.2	31	282	2.4	30	228	2.4	31	223	2.2
500	31	269	3.6	30	308	2.5	28	239	1.9	31	284	3.0	--	---	----	--	---	----
1,000	31	268	5.1	28	308	3.0	27	275	3.2	29	275	4.3	--	---	----	--	---	----
1,500	30	253	5.9	24	288	4.5	25	279	4.9	26	267	4.9	30	231	2.5	--	---	----
2,000	30	258	6.2	21	281	5.6	22	277	6.2	24	275	4.6	30	224	1.9	31	219	2.4
2,500	30	263	7.4	17	275	5.4	21	287	8.0	20	282	5.2	29	226	1.8	30	237	2.8
3,000	29	262	8.3	14	285	6.5	18	282	9.5	17	300	6.0	28	257	3.1	29	235	3.2
4,000	29	269	9.2	12	295	9.7	15	277	11.2	11	325	6.3	24	256	6.2	27	242	3.8
5,000	29	270	10.3	10	295	14.9	14	276	13.2				22	270	8.0	23	263	5.8
6,000	29	268	11.2	10	289	17.0	12	276	13.8				21	278	9.9	18	272	8.3
8,000	28	262	15.8										20	286	13.0	12	295	11.2
10,000	27	260	19.7										17	281	17.4			
12,000	27	260	18.7										16	285	21.6			
14,000	26	262	14.0										12	290	21.3			
16,000	25	259	8.7															

Altitude (meters) m.s.l.	Grand Junction, Colo. (1,475 m.)			Green Bay, Wis. (210 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Little Rock, Ark. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	272	3.7	30	248	2.2	28	253	1.6	30	3	0.8	31	78	2.7	29	213	1.0
500	--	---	----	30	251	3.6	28	246	2.5	--	---	----	31	94	1.2	29	221	1.7
1,000	--	---	----	28	258	4.8	27	247	3.9	30	325	1.3	29	254	.7	28	223	1.2
1,500	31	271	3.8	24	271	5.8	27	255	4.6	30	261	.9	26	277	2.6	27	258	2.3
2,000	31	274	4.6	19	274	6.1	26	276	5.6	28	253	3.2	23	280	4.2	25	292	4.2
2,500	31	271	4.1	17	273	6.5	24	287	6.5	27	264	5.0	21	284	5.4	21	306	5.3
3,000	31	268	4.3	16	273	7.4	23	287	8.7	24	271	7.1	19	276	6.5	21	301	6.5
4,000	29	256	6.0	13	280	6.5	18	289	10.8	17	278	11.3	15	278	8.1	17	306	8.4
5,000	28	260	7.7	12	285	8.2	13	292	13.5	16	286	14.6	13	285	10.0	14	309	10.5
6,000	25	277	9.2	11	295	10.0							13	283	11.2	11	299	13.2
8,000	21	287	13.4															
10,000																		

Altitude (meters) m.s.l.	Medford, Ore. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			Oakland, Calif. (8 m.)			Omaha, Nebr. (306 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	316	1.7	30	120	2.6	31	159	0.1	28	304	2.4	31	266	5.2	29	284	1.4
500	31	320	2.0	30	146	2.2	31	67	.4	28	287	3.2	30	283	3.7	29	291	1.5
1,000	31	308	2.1	29	229	1.9	27	229	.2	28	283	3.7	28	298	3.1	27	271	1.4
1,500	31	265	2.1	29	265	3.4	18	337	2.5	25	251	3.3	28	303	3.2	24	275	2.3
2,000	30	235	3.2	29	269	4.2	18	321	3.1	25	266	4.9	28	310	2.7	22	298	3.5
2,500	29	236	3.3	27	266	4.8	13	314	6.6	22	273	6.1	27	309	2.9	17	302	4.4
3,000	29	246	4.7	25	266	5.2	12	308	9.0	21	276	6.1	27	302	3.4	15	305	6.3
4,000	26	255	7.9	20	247	5.0	10	302	11.9	18	275	8.6	26	301	5.7	14	309	8.0
5,000	23	260	10.1	15	264	5.7				16	281	11.7	24	294	8.3	13	306	9.8
6,000	22	261	11.7	12	275	7.2				14	282	15.1	22	289	11.8	11	308	14.5
8,000	19	261	18.0										15	278	12.8			
10,000	13	274	25.[illegible]															

Altitude (meters) m.s.l.	Phoenix, Ariz. (345 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	254	1.4	31	15	1.5	30	319	1.8	14	307	3.2	31	127	2.9
500	31	246	2.3	--	---	----	30	335	2.5	14	307	4.3	31	133	3.7
1,000	31	225	2.5	31	13	1.3	27	306	3.1	13	304	4.8	31	143	3.5
1,500	31	215	2.5	30	353	1.3	23	305	3.7	11	308	4.1	29	158	2.5
2,000	31	209	2.9	27	270	1.7	21	304	3.8				28	218	2.2
2,500	31	216	2.6	23	278	5.3	13	284	4.7				24	250	3.7
3,000	31	226	2.4	21	292	7.4	11	299	7.9				22	279	4.9
4,000	30	242	3.2	14	298	9.7							16	292	7.1
5,000	29	275	5.1	10	297	11.4							14	295	9.7
6,000	27	277	8.7	10	304	14.0							13	292	11.3
8,000	17	272	9.4										12	281	14.4
10,000	10	285	11.2										10	274	22.2
12,000															
14,000															
16,000															

Altitude (meters) m.s.l.	San Diego, Calif. (13 m.)			** Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (725 m.)			# Washington, D. C. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	248	3.8	31	277	2.9	31	196	2.1	31	258	0.8
500	27	274	2.2	31	280	3.4	--	---	----	31	303	1.4
1,000	20	293	.4	31	254	3.9	31	212	2.5	31	288	2.4
1,500	19	111	.2	31	249	3.6	31	226	2.5	31	278	3.9
2,000	19	28	.8	31	252	3.8	25	217	2.1	31	283	5.5
2,500	18	330	2.2	31	252	4.7	22	224	2.5	31	282	6.9
3,000	18	330	3.7	31	252	6.0	18	220	3.2	31	276	7.9
4,000	18	309	6.4	31	264	8.9	18	261	6.6	31	277	9.7
5,000	16	298	8.2	31	263	10.9	15	266	10.5	30	272	12.3
6,000	16	288	8.3	31	269	12.0	13	276	15.9	29	267	14.0
8,000	16	292	12.2	30	275	13.3				28	263	19.8
10,000	12	279	17.3	30	281	16.2				28	259	25.8
12,000				29	282	12.7				28	258	25.3
14,000				28	274	9.5				27	266	20.6
16,000				27	282	5.0				27	264	11.6

* Rawin Data (Cont'd.)
18,000 m., 25 obs. 262 dir., 3.9 speed
20,000 m., 24 obs. 253 dir., 1.9 speed
22,000 m., 23 obs. 178 dir., .6 speed
24,000 m., 19 obs. 113 dir., .7 speed
26,000 m., 17 obs. 186 dir., .6 speed

** Rawin Data (Cont'd.)
18,000 m., 24 obs. 273 dir., 1.6 speed
20,000 m., 21 obs. 244 dir., 1.2 speed
22,000 m., 20 obs. 109 dir., 1.5 speed
24,000 m., 16 obs. 103 dir., 2.6 speed
26,000 m., 10 obs. 92 dir., 4.0 speed

# Rawin Data (Cont'd.)
18,000 m., 27 obs. 261 dir., 4.0 speed
20,000 m., 24 obs. 257 dir., 1.0 speed
22,000 m., 21 obs. 95 dir., 1.1 speed
24,000 m., 16 obs. 56 dir., .6 speed

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

RAWIN DATA

Average monthly resultant winds

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Buffalo, N. Y. (182 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S. C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N. C. (275 m.)			Hatteras, N. C. (3 m.)			Int. Falls, Minn. (358 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	148	1.4	30	41	2.3	31	110	5.6	31	230	0.9	31	121	2.0	31	60	0.8	31	212	0.8	31	81	0.3	31	20	1.3	31	352	0.8	30	197	1.6	30	10	1.4
500	--	---	----	--	---	----	31	130	7.1	31	276	3.0	31	101	2.5	31	136	1.4	28	213	2.7	31	80	.2	--	---	----	31	293	1.5	30	230	3.7	30	21	2.5
1,000	--	---	----	30	29	3.5	31	134	4.9	31	276	4.3	29	74	2.3	31	163	2.2	28	256	2.2	31	267	2.4	--	---	----	31	271	2.7	30	244	4.4	30	25	3.8
1,500	--	---	----	30	5	2.2	31	155	3.2	31	261	4.8	29	77	1.8	31	210	1.7	29	272	3.5	31	280	3.9	31	12	1.4	31	277	3.1	30	251	5.2	30	5	2.7
2,000	31	245	2.6	30	305	3.4	31	185	1.8	31	261	5.5	29	323	.4	31	254	2.4	30	277	5.0	31	286	5.8	31	282	2.5	31	285	3.9	28	262	6.3	30	337	3.3
2,500	31	251	3.6	29	310	5.5	31	258	1.1	31	262	6.2	29	275	3.1	31	253	2.7	30	280	6.2	31	287	7.3	30	274	3.9	31	282	4.8	28	257	6.5	28	336	4.0
3,000	31	266	4.5	28	312	7.1	31	293	1.9	31	261	6.9	29	277	4.4	31	254	3.3	30	282	7.7	31	288	8.1	30	276	4.9	31	273	5.8	27	255	7.8	27	339	3.7
4,000	31	270	5.9	26	304	9.1	31	301	5.5	30	263	7.9	29	279	6.6	30	251	5.4	31	274	11.1	31	289	11.3	31	273	5.2	31	273	8.7	28	262	10.7	26	316	6.1
5,000	31	262	6.5	25	303	12.4	31	299	7.8	29	264	8.3	31	276	7.4	29	247	4.5	30	271	12.7	31	289	13.9	31	270	7.3	30	273	11.4	27	261	14.2	26	312	7.8
6,000	28	277	6.2	23	306	16.2	30	301	8.7	28	262	9.4	31	275	9.8	28	249	5.7	29	270	14.7	31	293	16.6	30	280	7.8	28	270	12.3	25	257	15.5	26	300	9.0
8,000	28	291	7.4	16	286	17.0	29	285	13.6	28	264	11.9	31	273	13.5	25	246	6.8	24	257	15.6	31	286	19.6	28	280	8.7	25	272	15.5	23	259	17.8	24	299	10.8
10,000	27	283	9.4	11	280	19.5	26	275	19.5	28	266	16.9	31	261	15.8	23	245	11.4	18	258	18.6	31	283	24.8	25	303	10.4	17	271	15.3	17	273	15.5	18	291	12.7
12,000	25	284	12.6				21	271	26.4	27	266	16.9	28	260	21.9	20	251	14.8	13	261	22.5	31	278	24.4	18	299	6.0	12	266	15.3	15	270	19.6	15	287	15.8
14,000	21	287	15.4				15	275	21.3	25	270	11.9	21	265	23.9	13	253	5.1	11	278	21.3	31	282	18.2	16	298	8.3				13	278	18.6	11	261	9.2
16,000	16	283	10.8				10	275	11.1	17	278	7.7	16	273	17.8	12	263	3.8	10	284	10.4	30	289	10.6	13	310	8.6				12	296	7.4			
18,000	12	328	4.2													11	234	2.0	10	1	3.3	24	320	4.3	13	328	5.0				10	266	3.9			
20,000																			10	75	4.0	16	323	1.1	10	35	5.3									
22,000																									10	22	6.2									

Altitude (meters) m.s.l.	Little Rock, Ark. (80 m.)			Medford, Ore. (401 m.)			Miami, Fla. (12 m.)			Midland, Tex. (871 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			St. Cloud, Minn. (318 m.)			San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	153	0.2	31	313	3.0	31	139	1.9	31	99	1.8	29	224	1.3	31	245	0.3	31	272	4.4	31	114	2.0	31	45	1.8	31	338	0.6	31	128	3.9	31	127	3.0
500	31	164	1.9	31	318	3.7	31	148	2.6	--	---	----	28	257	4.4	30	331	.2	31	291	4.3	30	121	3.1	--	---	----	31	360	1.4	31	120	6.5	31	110	5.8
1,000	31	178	1.2	31	317	4.6	31	150	2.1	31	126	3.3	28	259	5.0	30	273	1.2	31	298	4.9	30	150	3.8	30	52	2.1	31	342	1.8	31	131	5.6	31	105	5.2
1,500	30	280	1.5	31	304	3.6	31	213	1.6	31	159	5.5	28	263	5.8	31	256	2.6	31	297	3.6	30	187	3.3	30	31	.9	31	307	3.1	31	150	2.6	31	100	4.0
2,000	30	284	3.1	31	264	2.8	31	242	2.8	31	205	4.0	28	257	7.2	31	275	3.9	31	308	3.2	30	242	3.4	30	294	2.4	31	300	4.5	31	221	1.5	31	96	3.0
2,500	30	286	4.3	31	235	4.5	31	241	3.8	31	244	3.6	28	258	8.2	31	281	5.3	31	307	3.1	30	261	4.6	30	297	3.7	31	301	5.5	31	256	2.1	31	92	2.5
3,000	29	302	6.0	31	244	5.3	30	240	4.4	31	262	4.7	29	254	8.3	31	286	7.2	31	296	3.1	31	268	5.2	30	295	6.6	31	303	7.5	31	274	3.5	31	102	1.7
4,000	26	303	7.6	31	261	8.1	30	260	5.2	31	273	7.2	26	246	8.1	30	287	9.8	31	288	5.2	30	298	8.8	30	306	11.0	29	307	9.6	31	295	7.0	31	128	.1
5,000	23	303	9.2	30	265	10.9	30	267	6.7	31	277	9.2	23	241	8.2	30	285	12.9	31	279	7.2	30	300	7.0	31	296	13.1	27	299	9.9	31	285	9.0	31	264	.5
6,000	22	296	10.7	29	263	13.4	30	265	8.7	31	278	9.2	23	234	10.8	27	285	13.8	30	269	8.8	28	292	9.0	30	299	14.0	27	299	12.0	30	277	10.2	30	268	1.9
8,000	15	293	10.7	27	254	18.9	29	265	13.5	29	279	12.4	20	259	16.3	23	275	15.3	29	273	14.2	25	277	11.2	24	289	13.9	24	310	14.2	29	279	13.2	28	270	5.7
10,000	11	275	10.9	19	261	23.2	28	263	20.0	26	285	14.6	14	260	21.2	17	257	15.4	25	273	14.8	24	272	14.1	21	268	16.3	19	290	13.8	28	278	19.4	27	274	9.8
12,000				10	257	22.3	27	267	26.7	19	277	17.5	10	257	18.9	15	264	19.2	17	271	18.8	23	273	17.5	17	265	17.4	12	278	16.0	25	275	23.7	26	283	14.3
14,000							21	277	27.4	16	279	19.4				13	260	19.8				22	279	17.8	16	271	16.3	12	290	10.8	25	277	23.9	26	281	16.7
16,000										13	287	13.8				11	263	7.0				16	280	9.1	10	259	11.2	14	295	5.1	18	281	15.9	25	279	11.5
18,000																						13	282	6.0				13	294	3.4	13	310	5.7	23	280	1.6
20,000																						11	37	2.6				12	57	2.2	10	2	3.5	21	87	6.6
22,000																																		19	80	12.3
24,000																																		15	89	16.8

Altitude (meters) m.s.l.	Santa Maria, Calif. (72 m.)			Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is., Wash. (33 m.)			Washington, D. C. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	261	3.6	31	288	1.7	30	184	1.2	31	226	2.0	31	248	0.4
500	30	318	3.1	31	315	2.2	--	---	----	31	239	2.2	30	276	2.6
1,000	30	342	4.2	31	281	1.7	30	210	1.4	31	217	2.3	30	297	3.6
1,500	30	19	3.0	31	252	3.2	30	234	2.5	31	201	2.7	30	281	4.8
2,000	29	18	2.5	31	251	5.0	30	242	3.4	31	218	3.0	30	278	6.1
2,500	29	340	3.6	31	255	5.7	30	261	3.8	30	245	4.1	30	276	6.3
3,000	29	311	4.3	31	268	6.0	30	264	4.5	30	254	5.2	31	270	6.3
4,000	30	300	5.6	31	266	7.7	30	253	7.6	30	259	7.3	31	275	8.4
5,000	29	303	6.5	31	275	8.3	30	255	10.3	30	259	9.1	31	265	10.1
6,000	29	287	8.8	30	265	8.7	29	263	12.3	29	255	12.5	30	266	12.4
8,000	27	283	10.5	30	272	10.6	27	269	15.5	28	258	19.9	30	260	18.0
10,000	27	285	13.9	30	279	14.2	25	263	20.0	17	246	21.6	29	263	23.6
12,000	25	273	17.0	21	274	16.2	23	261	19.2	13	259	18.9	29	263	23.6
14,000	23	273	16.3	14	270	10.4	19	264	13.7	12	252	9.8	28	267	18.3
16,000	23	274	11.2	10	268	9.4	14	263	7.2	12	266	5.6	28	265	10.1
18,000	21	309	3.7							12	264	2.6	23	250	3.9
20,000	21	68	3.1							12	139	3.4	21	138	.4
22,000	15	79	5.2										19	31	1.7
24,000													11	56	2.2

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.: directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following Table 22 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

RAWIN DATA

Average monthly resultant winds

Table 22 *Air Force Data for January 1954

Altitude (meters) m.s.l.	Denver, Colo. (1,661 m.)			Ft. Worth, Tex. (178 m.)			Ogden, Utah (1,450 m.)			Rantoul, Ill. (227 m.)			Rome, N. Y. (146 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface----------	31	177	1.8	31	125	0.7	30	123	0.9	29	268	1.4	30	329	1.5
500--------------	--	---	----	30	198	2.8	--	---	----	28	254	4.4	29	261	3.8
1,000------------	--	---	----	30	216	5.0	--	---	----	28	256	6.9	29	278	8.5
1,500------------	--	---	----	30	248	6.2	30	137	1.4	28	274	8.8	29	283	12.0
2,000------------	28	226	2.5	31	249	7.9	29	211	4.6	28	274	12.0	29	281	13.4
2,500------------	28	258	4.0	31	255	8.7	30	239	6.4	28	275	13.9	29	279	14.7
3,000------------	28	273	6.3	31	256	10.1	30	246	8.5	29	276	16.6	29	281	15.8
4,000------------	28	275	10.0	30	266	13.3	24	263	10.9	30	275	20.7	28	282	17.7
5,000------------	28	280	13.0	30	270	15.8	20	271	14.4	29	276	25.4	25	282	20.1
6,000------------	30	281	14.2	29	270	17.2	17	281	16.4	29	276	29.9	25	276	24.8
8,000------------	28	273	20.3	29	269	24.0	14	279	22.8	29	274	36.4	24	273	30.1
10,000-----------	27	270	25.3	27	271	30.9	12	271	29.1	26	272	40.7	21	273	31.4
12,000-----------	19	270	26.0	22	265	33.9				24	268	41.7	17	278	30.4
14,000-----------				17	270	31.6				15	262	36.9			
16,000-----------				12	269	23.6									

* February data for the above Air Force stations will be included in the June issue of this publication.

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following Table 22 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun. MAY 1954

ALBUQUERQUE, N. MEX.

Date	Sun's zenith distance A. M. 78.7°	75.7°	70.7°	60.0°	0.0°	P. M. 60.0°	70.7°	75.7°	78.7°
Air mass	4.08	3.26	2.44	1.63	•1.0	1.63	2.44	3.26	4.08
May									
3	0.80	0.88	1.02	1.18	1.43	1.24	----	----	----
4	.86	.95	1.06	1.23	1.46	----	----	----	----
5	----	----	----	----	----	1.21	1.06	0.99	0.92
6	.80	.92	1.04	1.19	1.42	1.17	1.01	.90	.79
7	.65	.73	.83	1.03	1.37	1.07	.92	.76	----
8	.74	.84	.95	1.12	1.31	1.03	----	----	----
9	----	----	----	1.03	1.26	----	----	----	----
12	.79	.89	1.01	1.18	1.38	----	----	----	----
14	.71	.84	.99	1.13	1.41	1.14	.92	.79	----
15	.69	.80	.94	1.12	1.31	1.13	----	----	----
17	.68	.79	.88	1.09	1.28	----	----	----	----
18	----	----	----	----	----	----	----	.83	.73
19	.65	.80	.96	1.13	1.36	----	----	----	----
20	.86	.92	1.03	1.17	1.42	----	----	----	----
21	.17	.27	.38	----	----	----	----	----	----
23	----	----	----	----	----	1.17	1.07	----	----
24	----	----	----	----	----	----	1.03	.92	.84
25	.82	.92	1.03	1.18	1.33	----	----	----	----
26	.72	.82	.96	1.13	1.47	1.12	.99	.84	.73
27	.78	.87	1.01	1.19	1.42	----	----	----	----
28	.81	.90	1.03	1.20	1.39	1.16	1.02	.92	.80
29	.76	.86	1.00	----	----	----	----	----	----
30	.84	.92	1.04	1.21	1.39	----	----	----	----
31	.73	.82	1.00	1.19	1.44	1.20	1.00	.85	.76
Averages	.73	.83	.95	1.15	1.38	1.15	1.00	.85	.80
Departures	-.09	-.09	-.09	-.06	-.08	-.06	-.08	-.10	-.08

TABLE MOUNTAIN, CALIF.

Date	Sun's zenith distance A. M. 78.7°	75.7°	70.7°	60.0°	0.0°	P. M. 60.0°	70.7°	75.7°	78.7°
Air mass	3.76	3.01	2.26	1.51	•1.0	1.51	2.26	3.01	3.76
May									
1	----	----	----	----	1.57	----	----	----	----
4	----	----	----	1.38	----	----	----	----	----
5	1.06	1.14	1.25	1.38	----	----	----	----	----
8	----	----	----	----	1.60	----	----	----	----
10	----	----	----	1.41	----	----	----	----	----
14	----	----	----	----	1.48	----	----	----	----
Averages	(1.06)	(1.14)	(1.25)	1.39	1.55	----	----	----	----
Departures	.00	-.01	-.01	.00	.00				

BOSTON, MASS.

Date	Sun's zenith distance A. M. 78.7°	75.7°	70.7°	60.0°	0.0°	P. M. 60.0°	70.7°	75.7°	78.7°
Air mass	4.96	3.96	2.97	1.98	•0.99	1.98	2.97	3.96	4.96

NO DATA DURING MAY 1954

BLUE HILL, MASS.

Date	Sun's zenith distance A. M. 78.7°	75.7°	70.7°	60.0°	0.0°	P. M. 60.0°	70.7°	75.7°	78.7°
Air mass	4.86	3.89	2.92	1.94	•0.97	1.94	2.92	3.89	4.86
May									
9	----	----	----	----	----	----	0.86	0.72	0.62
11	.66	.78	.91	----	----	----	----	----	----
17	----	----	----	----	----	----	.90	.78	.68
18	.92	1.02	1.12	1.28	----	----	----	----	----
25	----	.86	1.01	1.13	----	----	----	----	----
26	.77	.86	1.05	1.21	----	1.22	1.05	.91	.82
30	----	----	----	----	----	1.20	.97	.84	.72
31	.78	.88	1.03	1.19	----	1.10	----	----	----
Averages	.78	.88	1.02	1.20	----	1.17	.95	.81	.71
Departures	.08	.06	.05	.09	----	.09	.05	.05	.06

LINCOLN, NEBR.

Date	Sun's zenith distance A. M. 78.7°	75.7°	70.7°	60.0°	0.0°	P. M. 60.0°	70.7°	75.7°	78.7°
Air mass	4.77	3.81	2.86	1.91	•0.95	1.91	2.86	3.81	4.77
May									
5	----	----	----	----	1.29	----	----	----	----
7	----	----	----	----	1.26	1.01	----	----	----
8	----	----	----	----	1.26	----	----	----	----
13	----	----	----	----	1.24	----	----	----	----
19	----	----	----	----	1.30	1.09	----	----	----
27	----	----	----	----	1.26	----	----	----	----
28	----	----	----	----	1.34	1.12	0.97	0.86	0.73
Averages	----	----	----	----	1.28	1.07	(.97)	(.86)	(.73)
Departures	----	----	----	----	-.08	-.04	.07	.07	.06

MADISON, WIS.

Date	Sun's zenith distance A. M. 78.7°	75.7°	70.7°	60.0°	0.0°	P. M. 60.0°	70.7°	75.7°	78.7°
Air mass	4.81	3.84	2.88	1.92	•0.96	1.92	2.88	3.84	4.81

NO DATA DURING MAY 1954

• Extrapolated

Langley is the unit used to denote one gram calorie per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

SOLAR RADIATION DATA

MAY 1954

Table 31a Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	7	8	9	10	11	12	13		14	15	16	17	18	19	20		21	22	23	24	25	26	27	
Langleys	84	---	---	---	140	130	146	(125)	168	153	98	169	153	133	127	143	49	101	156	178	156	176	158	140
Date	28	29	30	31	1	2	3																	
Langleys	143	160	165	170	179	118	201	162																

Table 31b Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	7	8	9	10	11	12	13		14	15	16	17	18	19	20		21	22	23	24	25	26	27	
Langleys	111	36	84	129	351	487	290	213	489	330	72	195	471	187	223	280	37	149	267	122	397	398	441	259
Date	28	29	30	31	1	2	3																	
Langleys	138	387	228	418	410	105	463	307																

Table 31c Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	7	8	9	10	11	12	13		14	15	16.	17	18	19	20		21	22	23	24	25	26	27	
Langleys	162	29	125	148	254	158	269	164	283	208	66	190	266	205	115	190	27	111	125	194	179	264	263	166
Date	28	29	30	31	1	2	3																	
Langleys	180	225	249	243	245	86	207	205																

Table 31d Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	7	8	9	10	11	12	13		14	15	16	17	18	19	20		21	22	23	24	25	26	27	
Langleys	330	45	303	132	258	363	474	272	438	205	293	458	343	225	139	300	48	155	130	459	171	537	412	273
Date	28	29	30	31	1	2	3																	
Langleys	334	254	536	471	461	173	378	373																

Table 31e Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	7	8	9	10	11	12	13		14	15	16	17	18	19	20		21	22	23	24	25	26	27	
Langleys	211	55	142	185	209	198	309	187	299	253	96	207	147	253	200	208	44	171	218	252	177	68	87	145
Date	28	29	30	31	1	2	3																	
Langleys	220	173	133	75	128	169	234	162																

Note: Langley is the unit used to denote one gram calorie per square centimeter.

SOLAR RADIATION DATA

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys. MAY 1954

1954	Albrook Air Base, Panama, C. Z.	Albuquerque, N.Mex.	Annette, Alaska	Apalachicola, Fla.	Astoria, Oreg.	Atlanta, Ga.	Barrow, Alaska	Bethel, Alaska	Bismark, N. Dak.	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Tex.	Canton Island, Pacific Area	Caribou, Me.	Charleston, S. C.	Columbia, Mo.	Davis, Calif.	Dodge City, Kans.	East Lansing, Mich.	East Wareham, Mass.	El Paso, Tex.	Ely, Nev.	Fairbanks, Alaska	Fort Worth, Tex.	Fresno, Calif.	Grand Junction,Colo.	Great Falls, Mont.	Greensboro, N. C.	Griffin, Ga.	Hatteras, N. C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.	Lake Charles, La.
May 7------	665	781	764	723	558	635	520	458	602	---	604	416	314	618	197	627	748	653	497	562	324	722	740	565	529	628	756	609	---	699	567	509	761	334	587
May 8------	589	781	662	624	226	804	357	557	(576)	---	466	99	375	664	243	531	570	649	287	285	---	748	620	605	639	691	714	550	636	778	465	414	810	94	606
May 9------	420	704	656	734	246	458	306	513	716	---	---	---	690	690	140	495	584	328	144	402	376	619	(722)	637	430	---	752	(604)	395	447	718	358	801	547	489
May 10------	593	472	174	680	362	795	466	682	701	---	652	---	617	523	148	708	679	705	211	372	272	721	(582)	639	50	585	580	317	783	739	807	299	810	470	424
May 11------	304	585	624	686	378	740	646	676	655	495	643	570	401	680	128	234	712	681	132	198	566	757	650	640	73	(712)	720	643	779	431	732	569	815	183	---
May 12------	453	(784)	171	544	503	654	534	682	660	303	727	378	370	680	269	677	633	682	459	520	386	750	516	662	115	673	726	685	687	659	786	662	803	60	338
May 13----	420	641	310	664	---	126	479	645	489	544	706	614	685	647	724	69	763	655	714	582	563	713	659	694	793	721	726	664	166	114	213	549	798	599	405
Averages------	492	(678)	480	665	379	602	473	602	(628)	---	633	415	493	643	264	477	670	622	362	417	415	719	(641)	635	376	(668)	711	(582)	574	552	612	480	800	327	475
Departures----	---	---	---	---	---	---	---	---	---	---	---	5	---	---	---	---	---	-27	---	25	-38	---	---	---	---	7	---	---	---	---	---	---	---	-107	---
May 14------	406	799	560	606	---	146	446	410	421	610	730	607	661	632	740	281	767	628	704	588	567	680	644	679	796	664	764	731	92	117	122	692	814	706	736
May 15------	347	790	441	749	450	288	611	548	698	422	642	460	551	632	625	159	741	703	702	590	403	735	539	652	777	620	748	697	181	264	310	693	393	581	678
May 16------	305	580	298	741	665	774	374	638	711	176	714	182	658	(696)	390	586	310	693	679	534	225	591	623	686	730	727	650	---	767	789	659	300	821	648	555
May 17------	424	614	262	582	560	664	414	658	621	415	722	483	648	(637)	421	614	652	690	159	498	426	613	743	686	651	634	807	686	681	676	791	649	775	699	705
May 18------	181	774	134	643	610	244	463	651	686	647	720	645	554	(581)	443	574	727	703	564	376	655	572	(764)	658	399	707	796	734	394	417	701	586	782	676	558
May 19------	205	696	336	638	592	691	(423)	700	698	412	630	416	---	(582)	471	564	624	717	604	442	438	743	771	696	704	698	865	332	445	608	384	323	756	518	565
May 20------	578	774	407	674	408	609	581	713	584	253	696	296	653	501	446	652	825	667	463	630	253	702	584	669	795	728	664	605	128	639	573	759	796	493	733
Averages------	349	718	348	662	564	488	(473)	617	631	419	693	441	621	(609)	505	490	664	686	554	523	424	662	(667)	675	693	682	756	631	384	501	506	572	734	617	647
Departures----	---	---	---	---	---	---	---	---	---	-47	---	48	---	---	---	---	---	60	---	128	-3	---	---	---	---	28	---	---	---	---	---	---	---	181	---
May 21------	228	639	470	749	343	822	618	622	490	61	623	51	555	636	423	692	742	743	726	530	144	671	(460)	621	692	782	567	154	757	815	533	723	878	168	717
May 22------	497	542	239	738	666	711	587	682	428	232	766	280	525	638	---	670	413	755	589	377	449	763	772	531	780	758	348	362	778	708	786	669	882	475	724
May 23------	645	578	248	707	456	782	606	543	312	269	764	274	301	658	163	(700)	738	731	(156)	600	345	745	788	629	510	726	735	480	718	782	809	705	809	758	700
May 24------	159	563	349	731	351	742	(489)	577	686	417	608	388	385	629	592	(669)	665	648	208	420	395	707	662	571	---	693	834	726	713	747	803	587	827	769	501
May 25------	481	659	417	584	558	788	527	(542)	738	459	486	430	573	662	136	701	453	738	(129)	636	476	772	436	641	528	(795)	508	275	765	624	770	358	870	568	---
May 26------	393	829	606	199	551	388	482	---	110	756	527	741	467	659	511	410	320	747	507	521	718	788	835	423	(456)	792	842	457	578	346	681	205	876	795	---
May 27------	432	830	364	423	539	594	488	418	361	738	780	729	653	634	789	202	669	754	768	174	703	801	813	(442)	755	777	848	577	637	612	556	281	862	426	561
Averages------	405	663	385	590	495	689	(543)	(564)	446	419	651	413	494	645	436	(582)	571	731	(441)	465	461	750	(681)	(551)	(620)	(760)	669	433	706	662	705	504	858	566	640
Departures----	---	---	---	---	---	---	---	---	---	-36	---	2	---	---	---	---	---	73	---	+61	1	---	---	---	---	80	---	---	---	---	---	---	---	86	---
May 28------	367	834	410	683	448	541	525	391	---	381	761	332	713	646	280	392	246	677	787	447	433	804	785	272	758	724	872	457	458	432	592	400	847	377	694
May 29------	450	820	542	585	356	481	569	527	698	543	234	532	702	618	534	471	806	711	771	600	568	675	532	557	678	774	744	760	663	606	647	583	---	403	681
May 30------	551	820	468	734	419	794	579	554	522	654	472	645	716	629	425	545	195	730	703	632	662	722	610	587	793	798	563	374	672	680	575	647	---	796	524
May 31------	290	840	591	745	581	687	505	539	760	729	365	710	688	652	697	536	485	670	640	378	704	776	604	513	697	711	796	488	647	632	808	612	---	742	706
June 1------	56	807	276	740	529	621	375	508	202	681	316	---	733	649	306	605	306	777	(618)	297	678	784	836	692	688	781	554	55	628	636	813	254	---	554	(663)
June 2------	390	844	352	751	381	721	352	615	135	186	777	268	657	677	44	620	(84)	730	(726)	110	275	797	849	267	657	761	866	(383)	759	739	765	322	868	22	683
June 3------	299	---	447	645	218	378	298	315	567	553	515	502	595	630	209	481	187	685	805	34	663	725	(753)	692	823	696	836	689	613	427	706	421	852	328	655
Averages------	343	828	441	697	419	603	458	493	481	532	491	498	686	643	356	521	(330)	711	(721)	357	569	755	(710)	511	728	749	747	(458)	634	593	701	463	---	460	(658)
Departures----	---	---	---	---	---	---	---	---	---	12	---	37	---	---	---	---	---	86	---	-87	62	---	---	---	---	65	---	---	---	---	---	---	---	-34	---
Accumulated Departures January 1 to June 3, 1954																																			
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	-28	546	---	---	---	---	4585	---	---	---	---	---	---	---	-336	---

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.-Continued

	Lander, Wyo.	Las Vegas, Nev.	Lincoln, Nebr.	Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBCO)	Madison, Wis.	Medford, Ore.	Miami, Fla.	Midland, Tex.	Nashville, Tenn.	Newport, R. I.
1954												
May 7------	638	721	647	530	304	343	420	619	666	530	362	538
May 8------	630	741	656	543	366	257	389	514	680	630	674	75
May 9------	693	715	642	391	489	343	428	457	667	---	770	501
May 10------	532	731	538	397	572	469	307	752	642	168	753	294
May 11------	705	623	581	380	525	646	332	637	605	543	607	489
May 12------	558	610	621	129	396	504	728	675	223	---	343	427
May 13------	665	626	660	784	372	484	704	776	167	---	95	271
Averages------	632	681	621	450	432	435	473	633	521	468	515	371
Departures----	---	---	158	---	---	---	15	---	---	---	22	-101
May 14------	733	658	652	731	505	519	715	665	496	*	166	593
May 15------	781	636	393	627	163	146	568	713	283	---	706	321
May 16------	667	669	499	659	667	630	715	737	382	---	703	372
May 17------	699	691	257	366	370	655	721	780	471	---	636	415
May 18------	789	729	378	736	384	591	470	779	616	---	548	686
May 19------	816	723	731	552	536	616	611	728	603	---	457	410
May 20------	651	676	661	780	424	531	746	691	551	---	665	218
Averages------	734	683	510	636	436	527	649	728	486	---	554	431
Departures----	---	---	8	---	---	---	173	---	---	---	57	-45
May 21------	476	685	600	762	190	200	676	---	594	---	818	83
May 22------	125	784	664	625	650	518	693	816	544	---	468	394
May 23------	856	751	193	678	634	732	540	772	575	---	804	456
May 24------	847	737	336	620	487	664	680	440	585	---	692	572
May 25------	601	753	396	319	558	594	762	---	611	---	688	471
May 26------	746	753	210	359	627	645	292	755	323	---	486	765
May 27------	492	734	596	412	475	370	121	831	339	---	559	740
Averages------	592	742	428	539	517	532	538	723	510	---	645	497
Departures----	---	---	-109	---	---	---	45	---	---	---	91	47
May 28------	508	764	639	702	264	223	247	682	421	---	368	461
May 29------	657	614	696	556	406	234	795	401	324	---	497	436
May 30------	365	706	464	641	657	616	707	776	334	---	772	719
May 31------	649	726	162	628	671	723	303	499	308	---	738	773
June 1------	796	736	693	769	633	665	147	844	289	---	618	741
June 2------	703	776	364	545	583	(660)	388	716	(389)	---	713	360
June 3------	814	759	538	704	248	231	59	455	267	---	660	759
Averages------	642	726	508	649	495	(479)	378	625	(333)	---	624	607
Departures----	---	---	-14	---	---	---	-121	---	---	---	76	76

	New York, N. Y.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Phoenix, Ariz.	Portland, Me.	Rapid City, S. Dak.	Riverside, Calif.	San Antonio, Tex.	Santa Maria, Calif.	S. Ste. Marie, Mich.	Schenectady, N. Y.	Seabrook, N. J.
1954												
May 7------	514	123	327	765	355	503	518	651	451	152	571	500
May 8------	46	660	403	711	387	634	506	718	243	771	46	278
May 9------	583	613	97	772	145	113	620	538	498	---	250	532
May 10------	224	704	109	772	236	273	649	536	766	146	104	260
May 11------	531	589	99	762	448	466	725	362	736	403	339	481
May 12------	462	416	420	730	---	623	626	653	719	734	223	613
May 13------	702	98	631	761	845	621	627	721	534	705	644	503
Averages------	437	457	298	753	403	462	610	597	564	485	311	452
Departures----	-10	---	---	---	---	---	36	---	---	---	---	---
May 14------	563	79	671	761	812	711	568	785	158	751	620	438
May 15------	393	232	642	755	795	474	273	775	511	371	590	479
May 16------	759	620	428	651	265	423	659	779	756	536	575	754
May 17------	355	527	160	646	740	447	705	717	623	681	604	223
May 18------	590	320	696	645	790	513	654	489	634	753	634	375
May 19------	236	395	317	742	641	642	659	643	593	783	204	558
May 20------	111	293	---	731	456	505	540	560	560	770	358	97
Averages------	430	352	486	704	643	531	580	678	548	663	512	418
Departures----	-13	---	---	---	---	---	50	---	---	---	---	---
May 21------	98	742	---	777	168	598	532	626	756	584	60	258
May 22------	452	721	---	774	263	529	669	454	790	716	203	651
May 23------	653	693	---	798	182	610	735	446	657	723	305	561
May 24------	475	634	---	770	597	785	732	447	642	---	448	623
May 25------	410	675	398	748	517	652	626	604	(777)	687	313	326
May 26------	696	591	700	806	872	242	642	568	803	828	690	661
May 27------	195	658	747	809	876	478	437	711	---	277	592	400
Averages------	426	674	---	783	496	556	625	551	(737)	636	373	497
Departures----	-25	---	---	---	---	---	55	---	---	---	---	---
May 28------	451	435	736	815	299	572	464	722	---	(197)	390	562
May 29------	401	436	755	775	303	726	205	769	---	---	137	472
May 30------	786	605	586	806	748	493	649	735	---	725	675	719
May 31------	760	696	618	802	771	776	739	661	---	97	633	701
June 1------	698	183	748	802	621	287	731	723	---	90	426	687
June 2------	550	582	568	795	196	203	709	758	---	630	146	691
June 3------	701	273	800	686	563	765	622	709	---	(192)	454	665
Averages------	621	459	688	783	500	546	588	725	---	(322)	409	642
Departures----	131	---	---	---	---	---	36	---	---	---	---	---

	Seattle, Wash. (U. of W.)	Seattle, Wash. (WBAS)	State College, Pa.	Stillwater, Okla.	Swan Island, W. I.	Tampa, Fla.	Toronto, Canada	Upton, N. Y.	Wake Island, Pacific Area	Washington, D. C. (Silver Hill Obs.)	Winnipeg, Manitoba
1954											
May 7------	313	633	113	670	500	691	70	558	(634)	209	471
May 8------	201	468	270	274	399	693	554	37	594	516	464
May 9------	---	280	409	220	---	699	563	417	704	441	659
May 10------	---	384	421	189	573	701	267	376	608	647	712
May 11------	---	625	308	152	301	687	325	---	684	444	669
May 12------	357	421	288	555	612	498	304	622	640	704	692
May 13------	---	720	534	667	633	411	690	440	651	458	449
Averages------	---	504	335	390	503	626	396	408	(645)	489	588
Departures----	---	---	-103	---	---	---	---	---	---	---	---
May 14------	---	751	705	687	558	644	678	515	682	245	617
May 15------	---	536	388	648	---	628	660	259	486	---	456
May 16------	---	784	706	359	606	753	409	592	668	800	578
May 17------	146	746	602	106	714	695	593	321	---	432	575
May 18------	639	746	648	702	699	780	393	570	619	381	762
May 19------	384	492	483	443	688	773	492	382	706	570	760
May 20------	219	383	161	384	691	687	584	194	---	90	404
Averages------	347	634	528	476	659	709	544	405	632	420	564
Departures----	---	---	112	---	---	---	---	---	---	---	---
May 21------	342	419	437	632	702	749	697	89	---	594	718
May 22------	614	664	528	622	623	664	720	499	671	---	255
May 23------	498	572	554	516	639	651	648	533	667	854	133
May 24------	240	392	722	501	---	694	635	535	692	812	365
May 25------	343	682	630	---	636	525	734	---	632	557	757
May 26------	385	384	560	544	---	203	762	727	657	698	751
May 27------	456	714	536	717	458	510	379	176	634	719	87
Averages------	411	547	567	589	612	571	654	427	659	642	438
Departures----	---	---	91	---	---	---	---	---	---	---	---
May 28------	428	460	610	592	371	532	385	619	680	617	247
May 29------	436	540	410	737	611	232	456	568	598	497	446
May 30------	320	263	790	542	451	343	751	753	(547)	701	606
May 31------	276	579	729	645	---	537	494	736	503	791	247
June 1------	281	787	344	723	661	669	329	724	---	---	467
June 2------	344	604	432	521	642	671	224	592	331	---	381
June 3------	361	205	434	770	482	615	193	703	---	704	575
Averages------	349	491	535	647	536	514	405	671	(532)	662	424
Departures----	---	---	36	---	---	---	---	---	---	---	---

Accumulated Departures January 1 to June 3, 1954

Lander, Wyo.	Las Vegas, Nev.	Lincoln, Nebr.	Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBCO)	Madison, Wis.	Medford, Ore.	Miami, Fla.	Midland, Tex.	Nashville, Tenn.	Newport, R. I.
---	---	175	---	---	---	-771	---	---	---	8743	---

New York, N. Y.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Phoenix, Ariz.	Portland, Me.	Rapid City, S. Dak.	Riverside, Calif.	San Antonio, Tex.	Santa Maria, Calif.	S. Ste. Marie, Mich.	Schenectady, N. Y.	Seabrook, N. J.
---	---	---	---	---	---	6951	---	---	---	---	---

Seattle, Wash. (U. of W.)	Seattle, Wash. (WBAS)	State College, Pa.	Stillwater, Okla.	Swan Island, W. I.	Tampa, Fla.	Toronto, Canada	Upton, N. Y.	Wake Island, Pacific Area	Washington, D. C. (Silver Hill Obs.)	Winnipeg, Manitoba
---	---	2471	---	---	---	---	---	---	---	---

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

* Recorder inoperative.

ILLUMINATION DATA

Table 34.-Daily illumination on a horizontal surface, tabulated in hundreds of foot-candle hours.

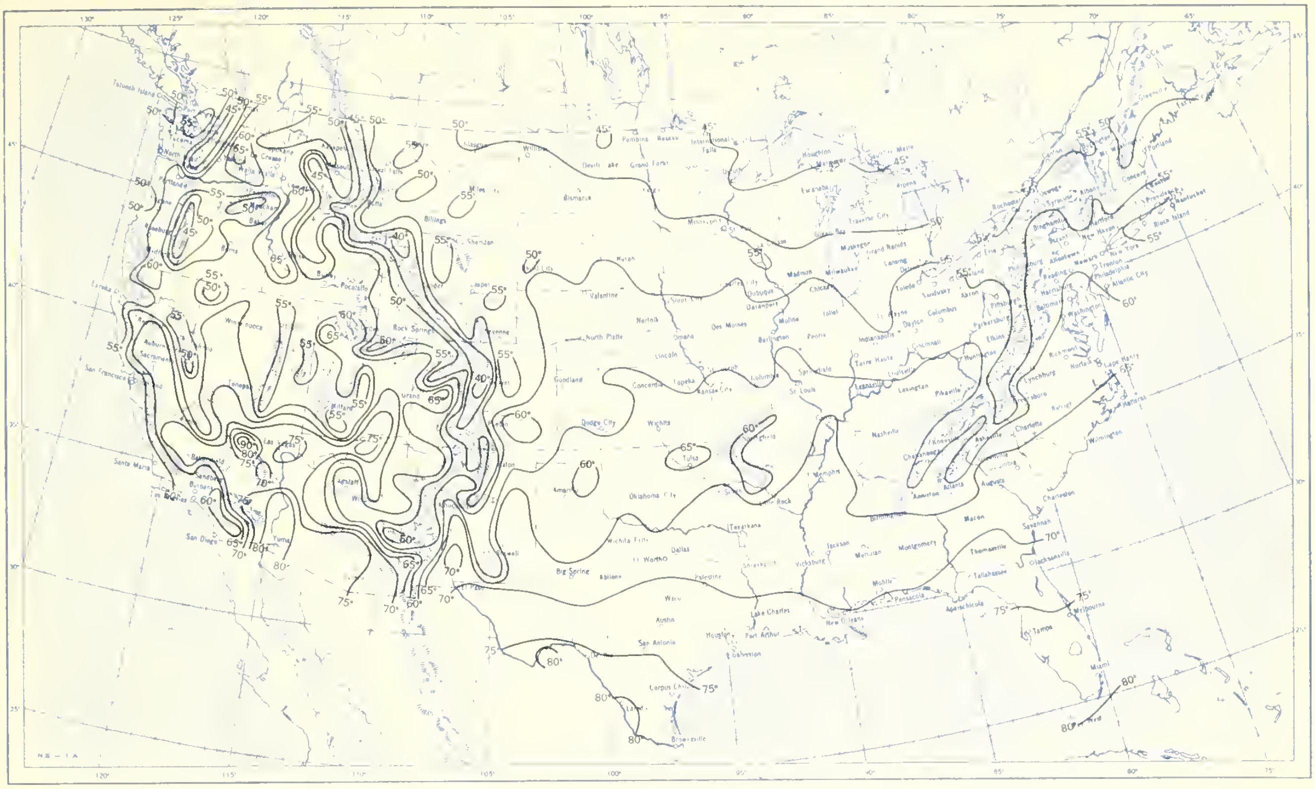
MAY 1954

Station	Day of month																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average
Baltimore, Md.----------------	570	---	490	522	684	670	303	462	555	602	608	648	522	372	478	834	290	322	552	100	458	(668)	728	732	464	716	627	495	472	862	812	554
Washington, D.C. (WBCO)-------	630	656	577	580	802	(733)	232	518	427	646	430	704	422	290	399	782	409	294	476	110	562	668	---	---	---	---	---	---	---	---	---	516

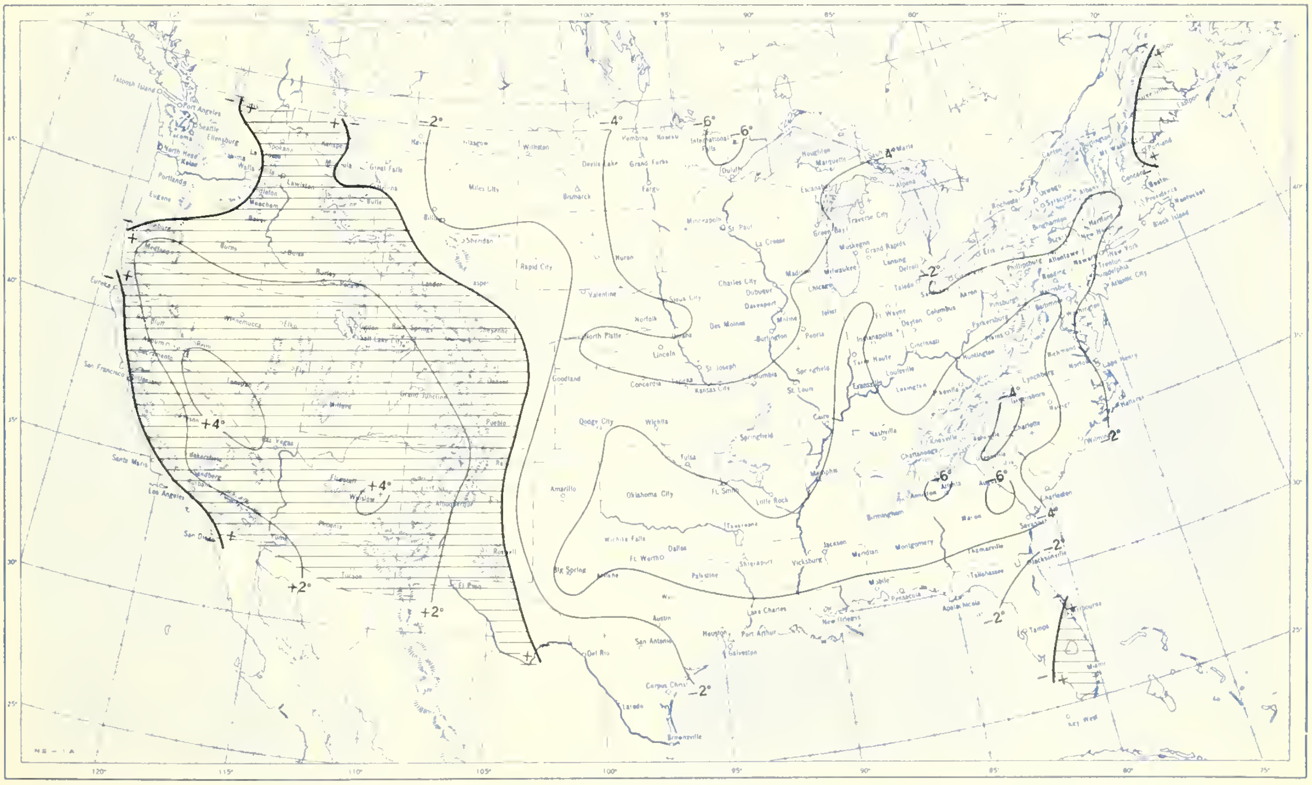
The foot-candle hour is the average illumination for one hour, in foot-candles. Foot-candle hours for a day are obtained by summing the foot-candle hours for the individual hours of that day. The illumination values are compiled from continuous records of the illumination output of a Foster Illuminometer. For a description of this instrument see "A Recording Daylight Illuminometer", by Norman B. Foster, in Illuminating Engineering, Vol. XLVI No. 2, pages 59 to 62.

NWRC, Asheville, N.C. --- 8/20/54 --- 1800

Chart I. A. Average Temperature (°F.) at Surface, May 1954.

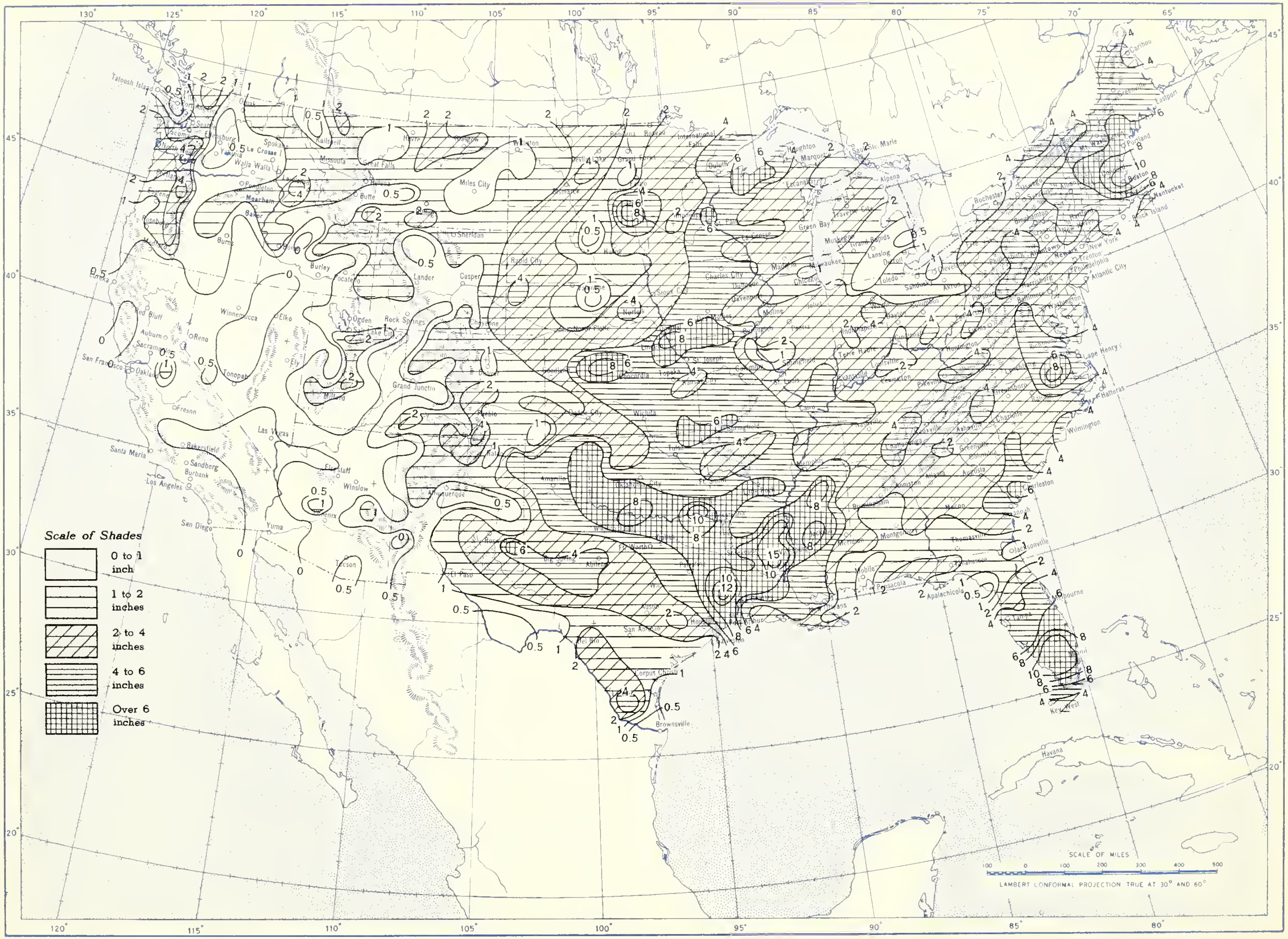


B. Departure of Average Temperature from Normal (°F.), May 1954.



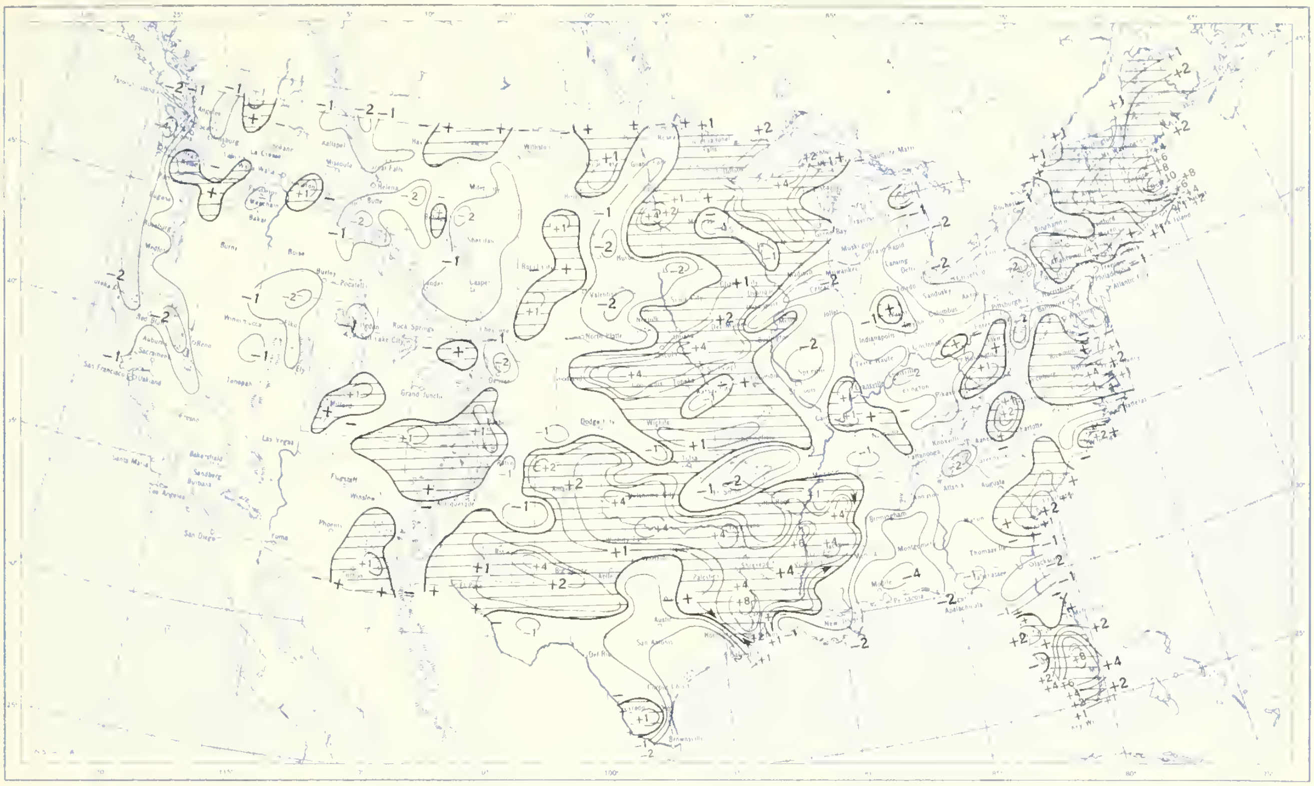
A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.
B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), May 1954.

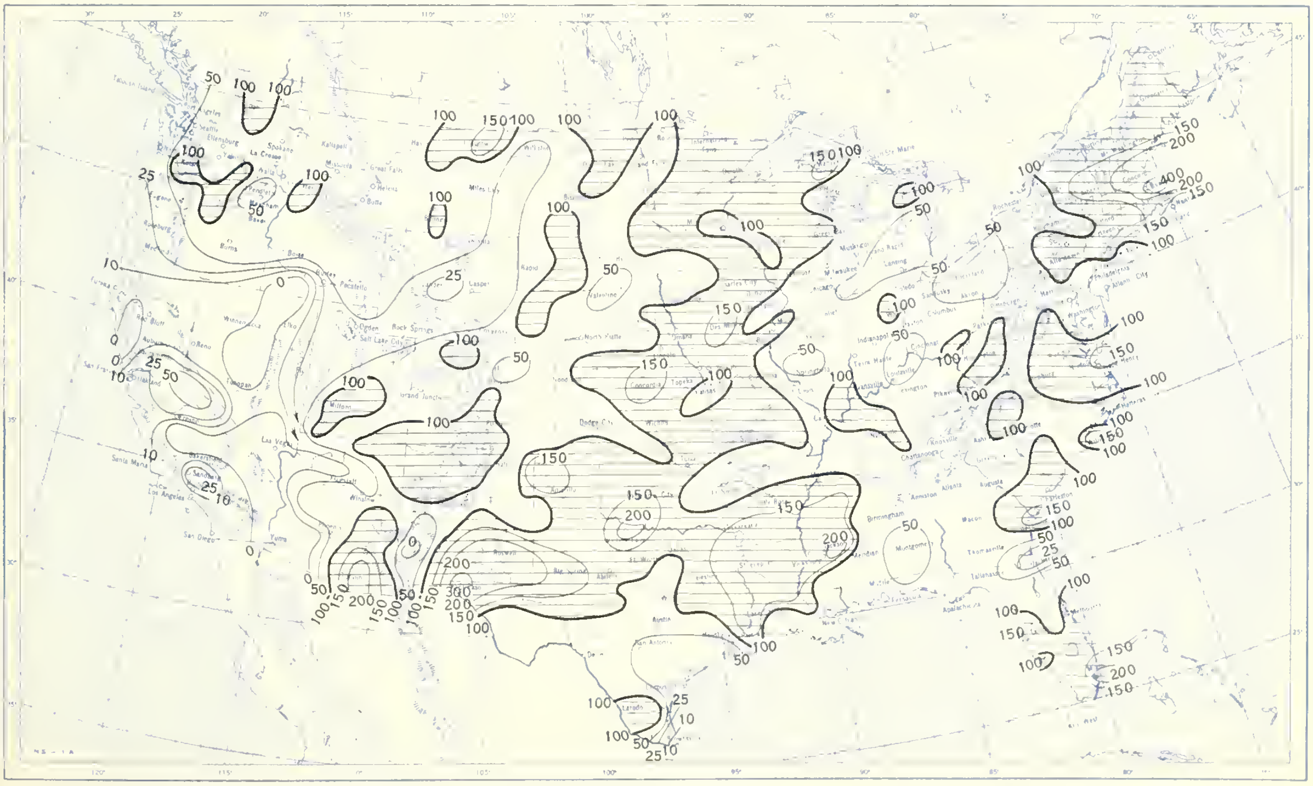


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), May 1954.

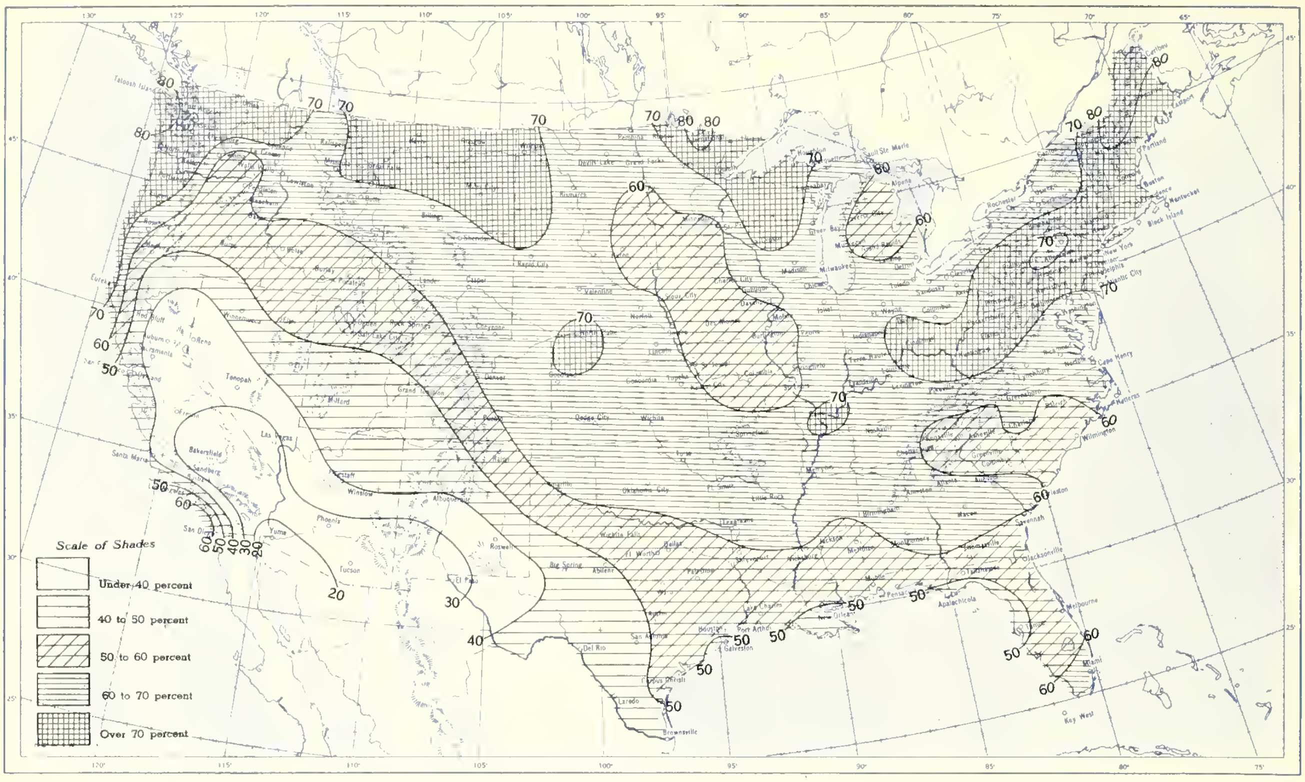


B. Percentage of Normal Precipitation, May 1954.

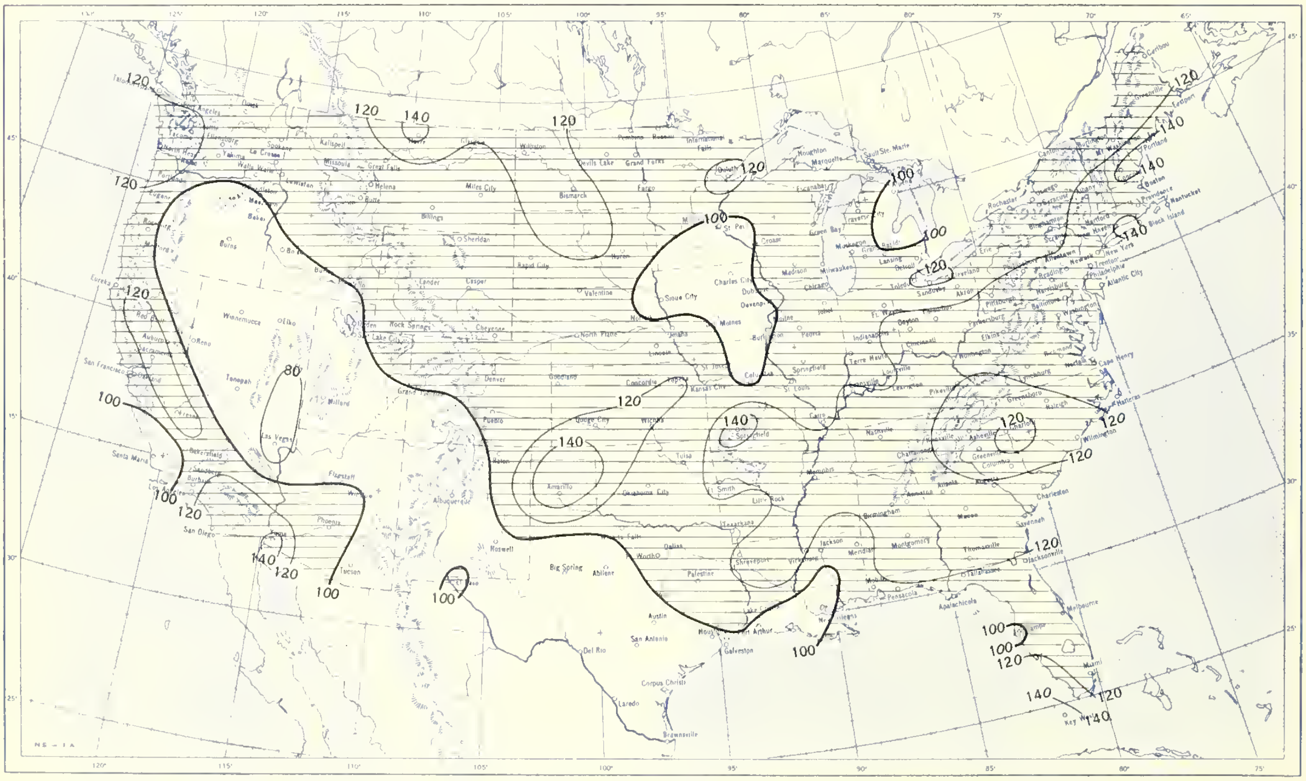


Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, May 1954.

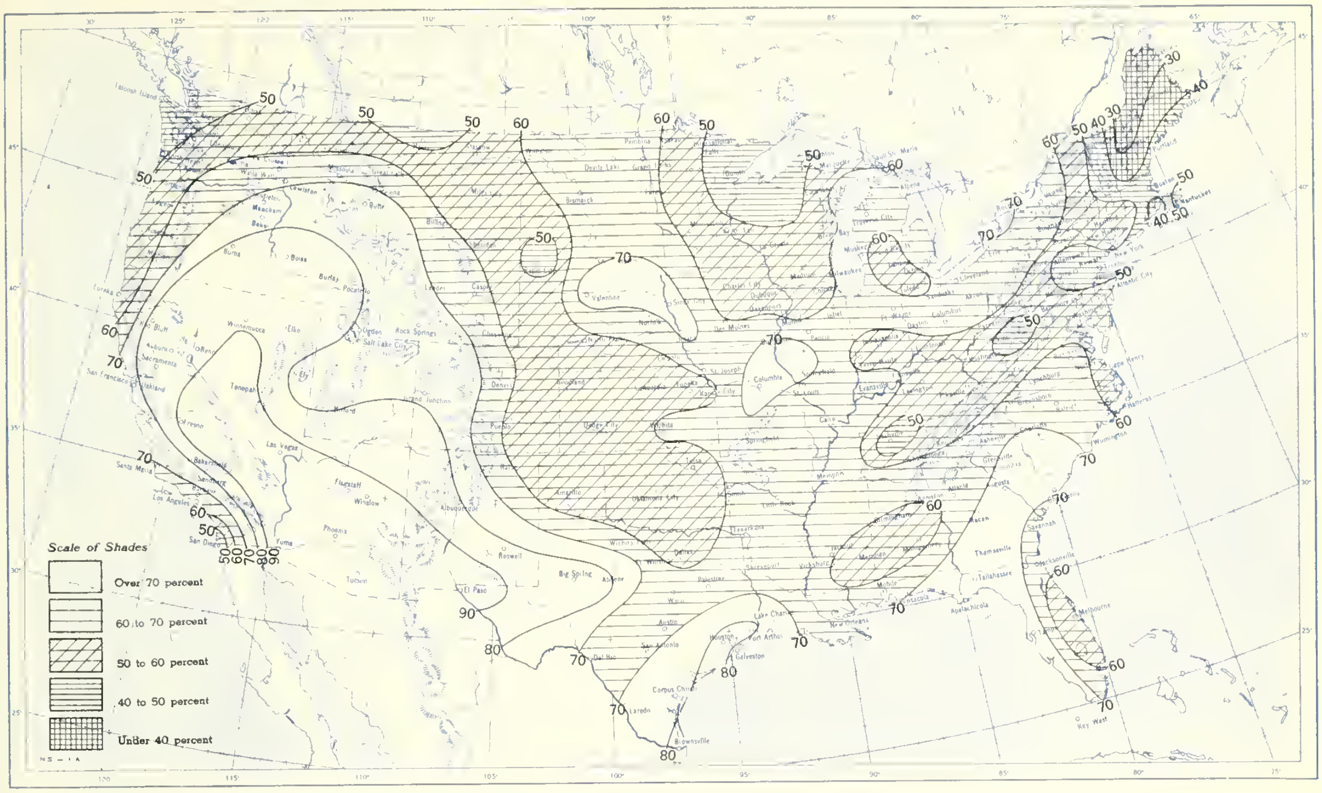


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, May 1954.

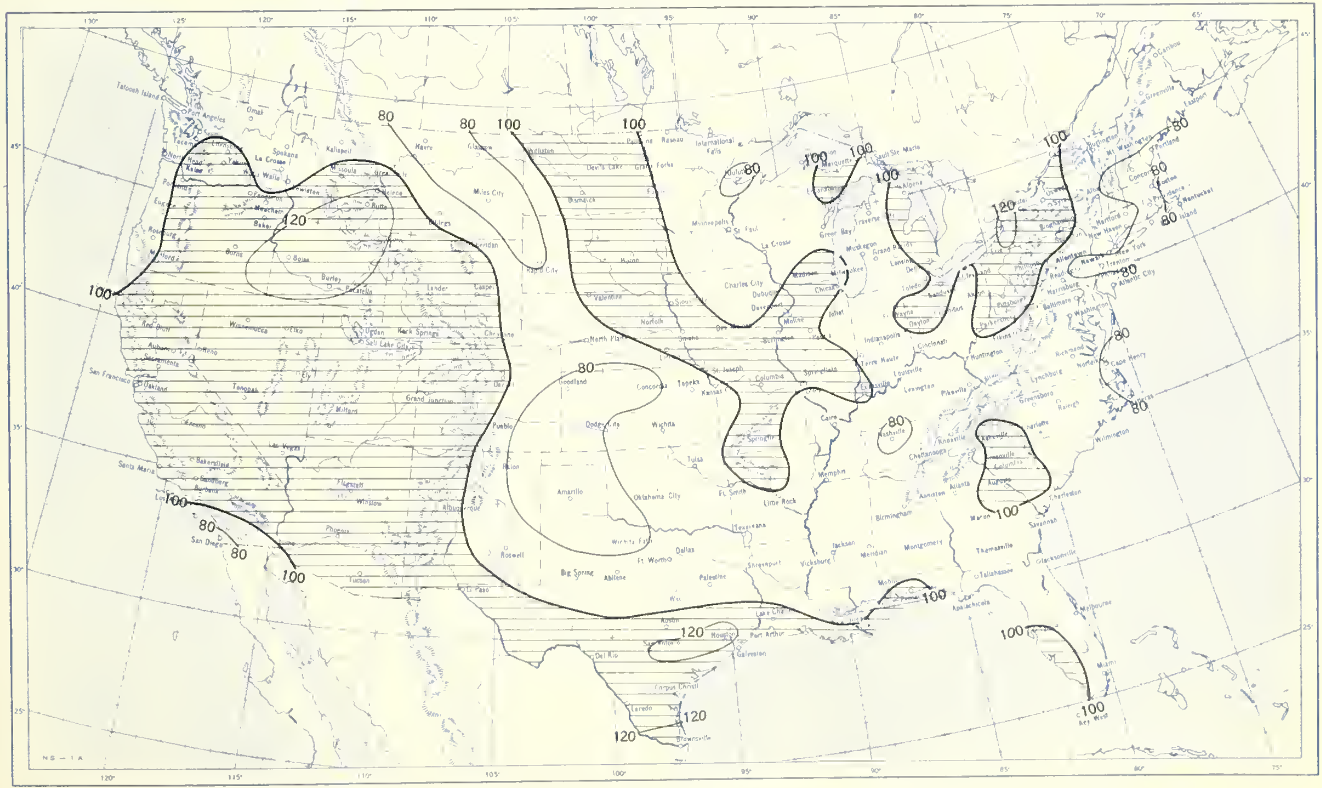


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, May 1954.



B. Percentage of Normal Sunshine, May 1954.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, May 1954. Inset: Percentage of Normal Average Daily Solar Radiation, May 1954.

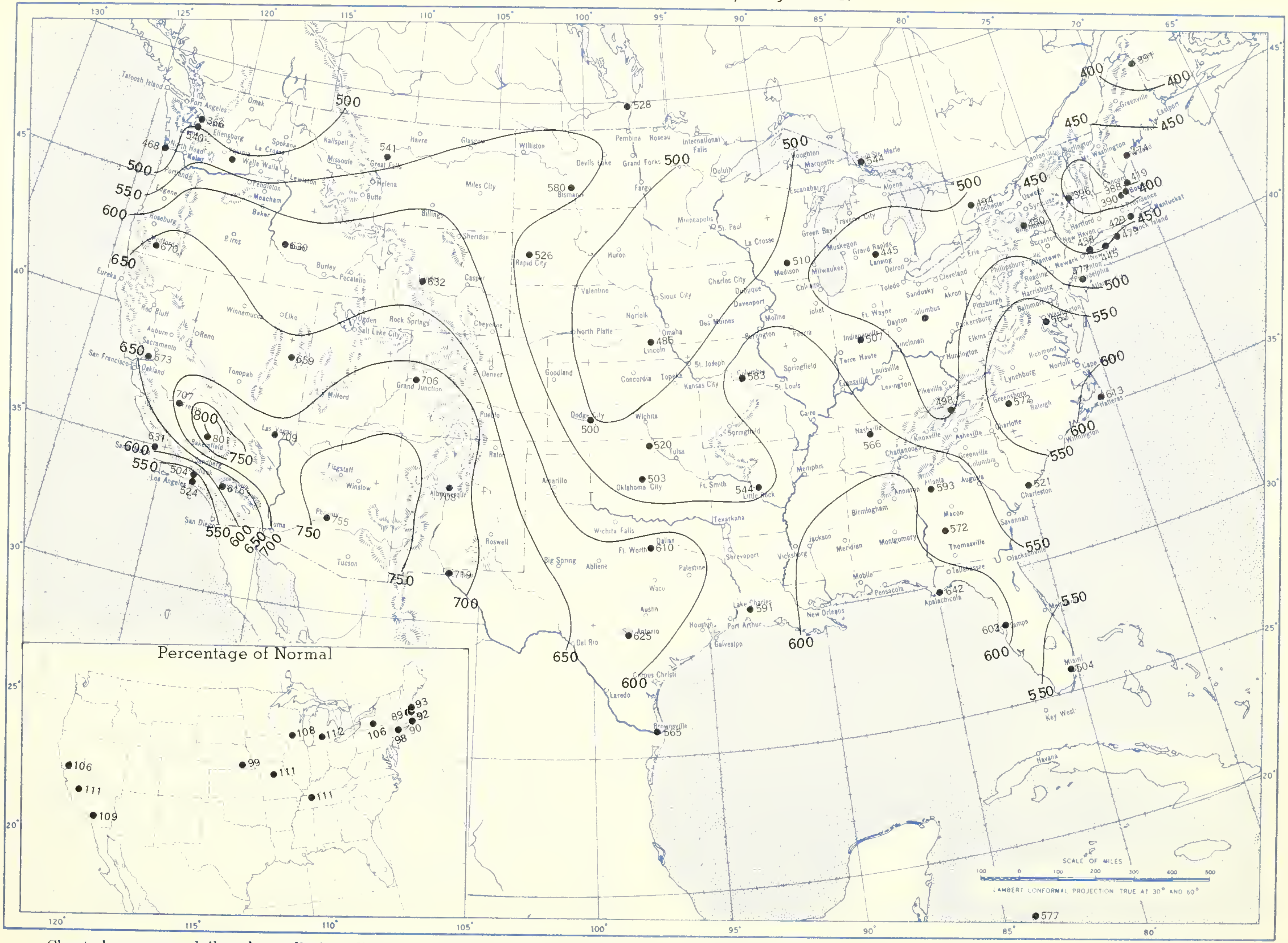
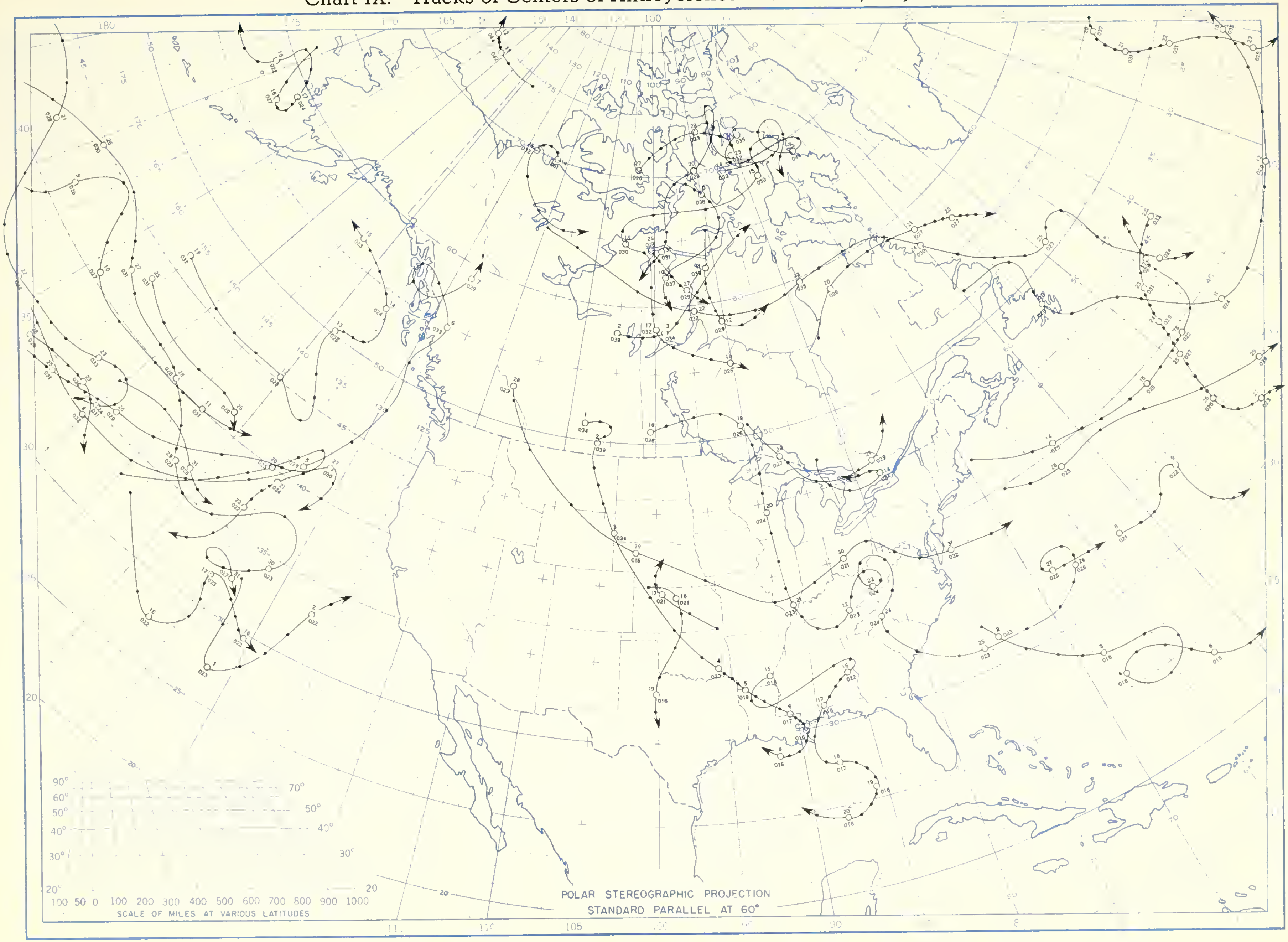


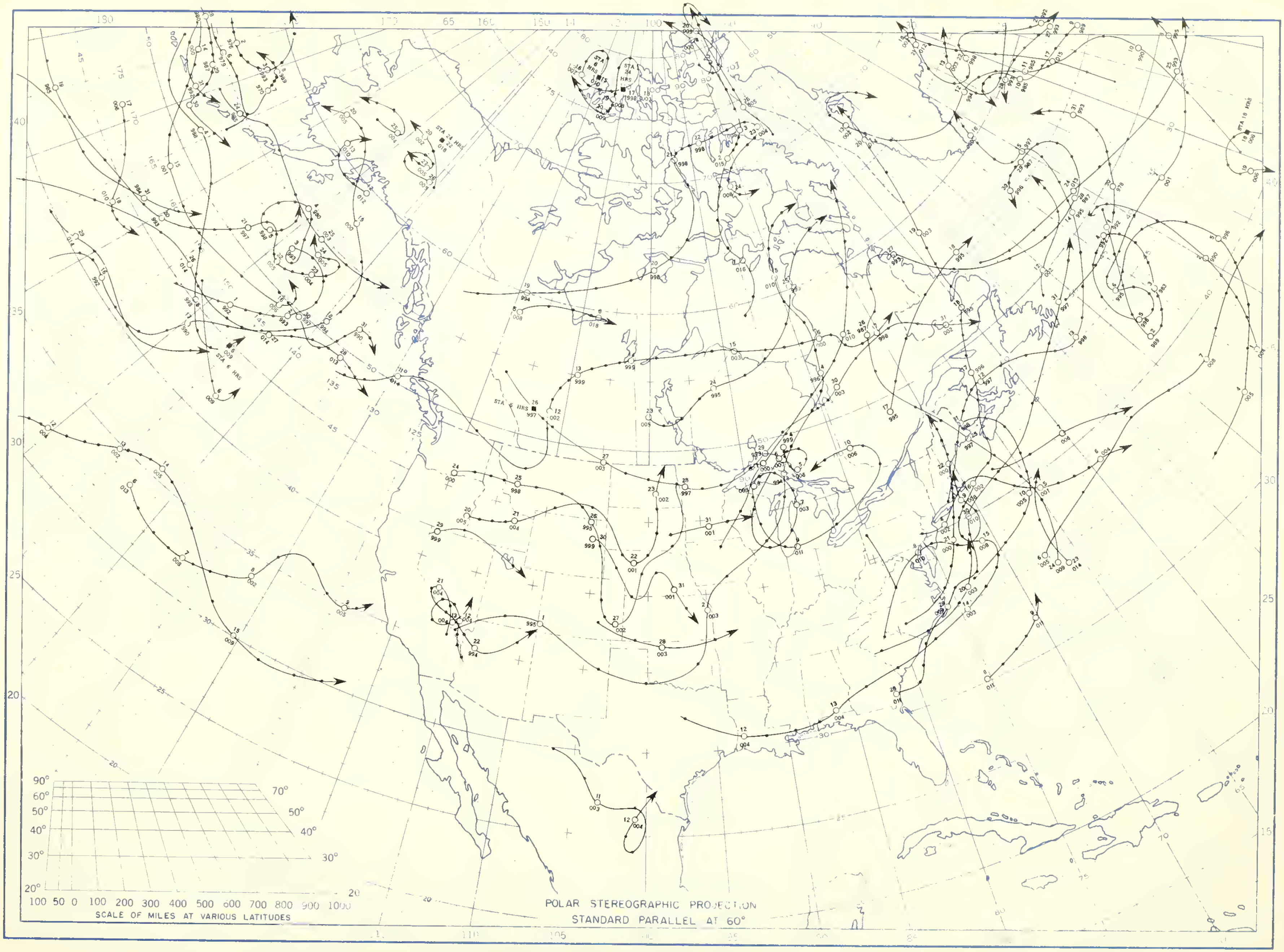
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm. $^{-2}$). Basic data for isolines are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are computed for stations having at least 9 years of record.

Chart IX. Tracks of Centers of Anticyclones at Sea Level, May 1954.



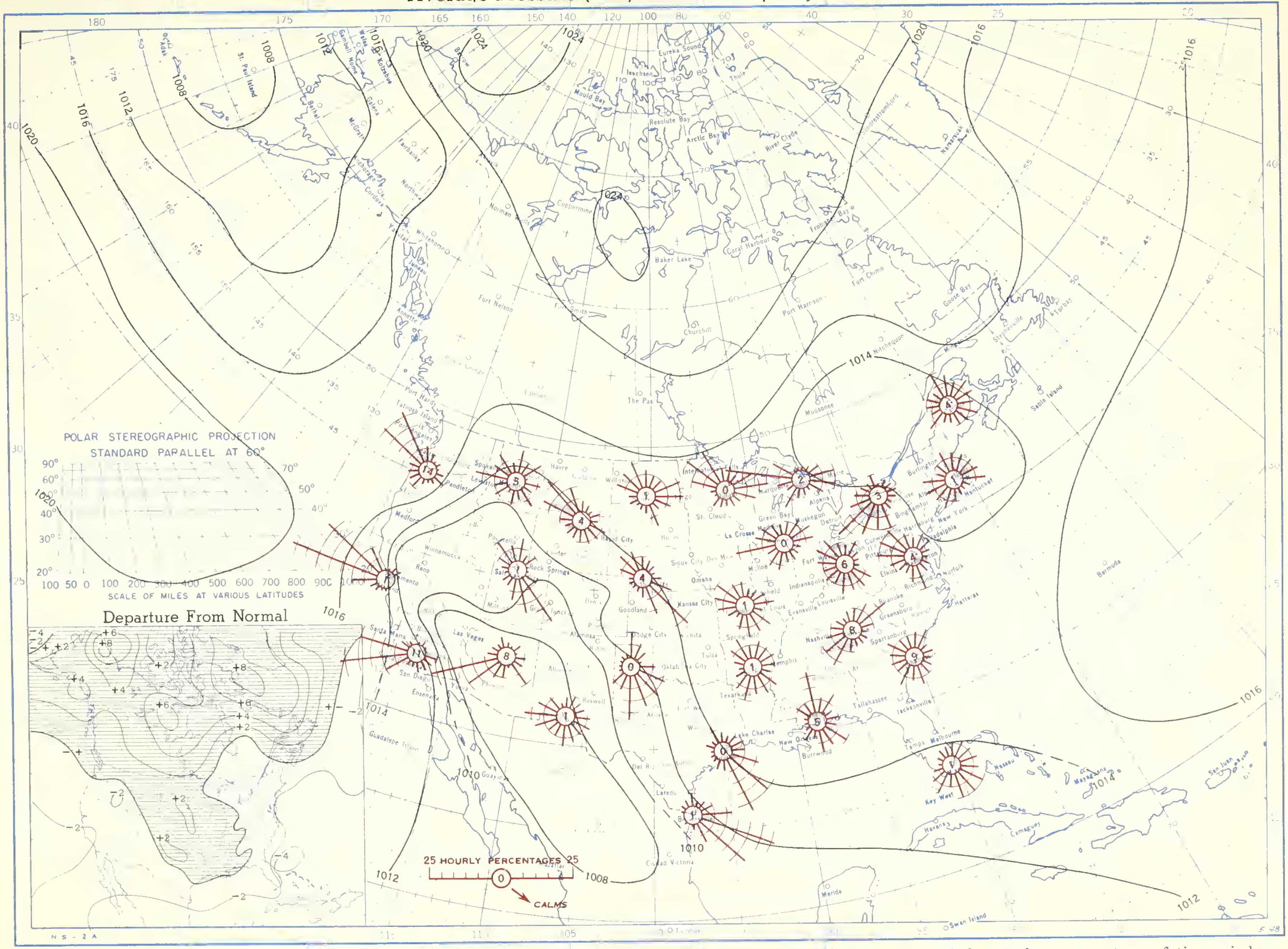
Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

Chart X. Tracks of Centers of Cyclones at Sea Level, May 1954.



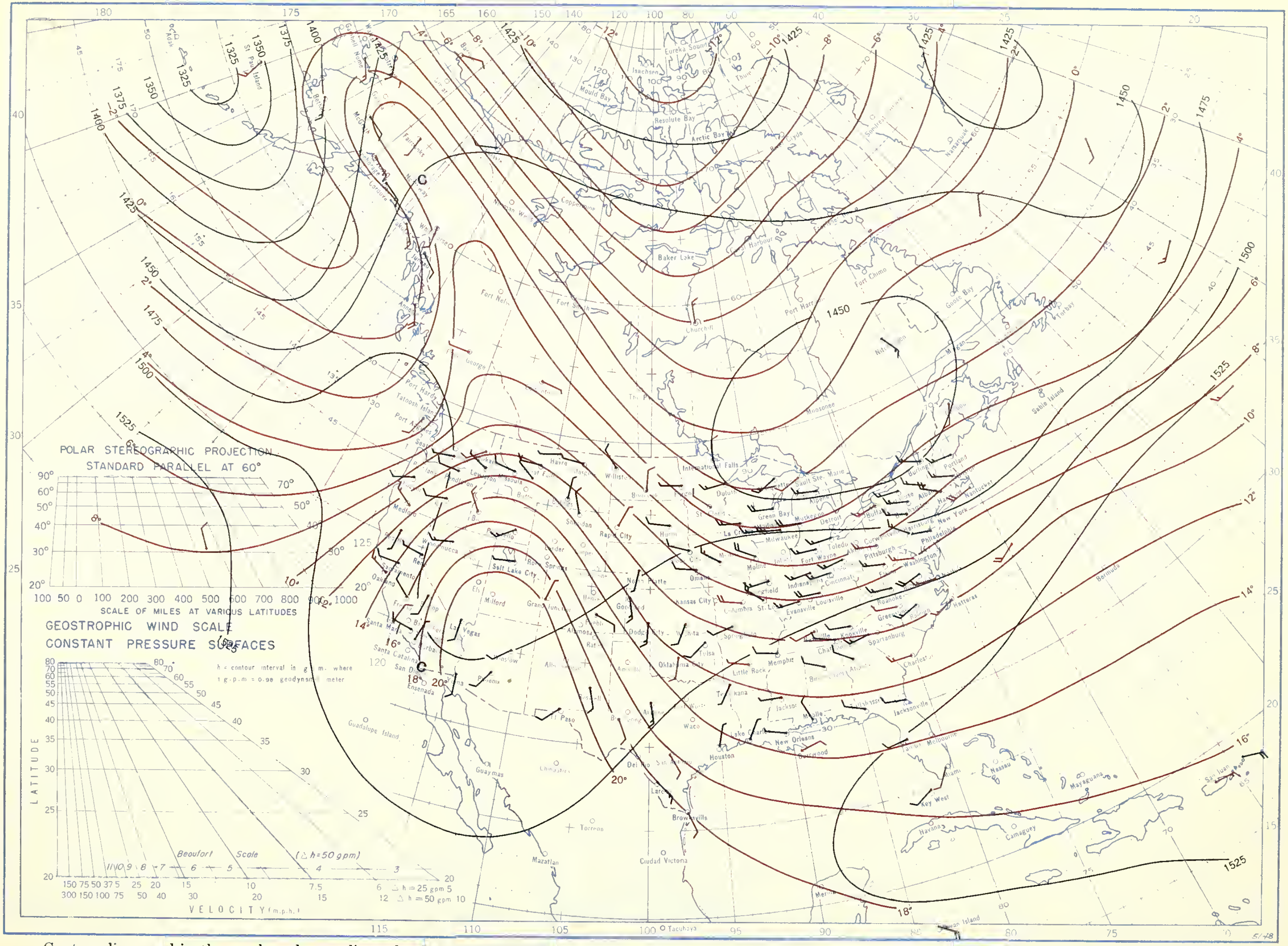
Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, May 1954. Inset: Departure of Average Pressure (mb.) from Normal, May 1954.



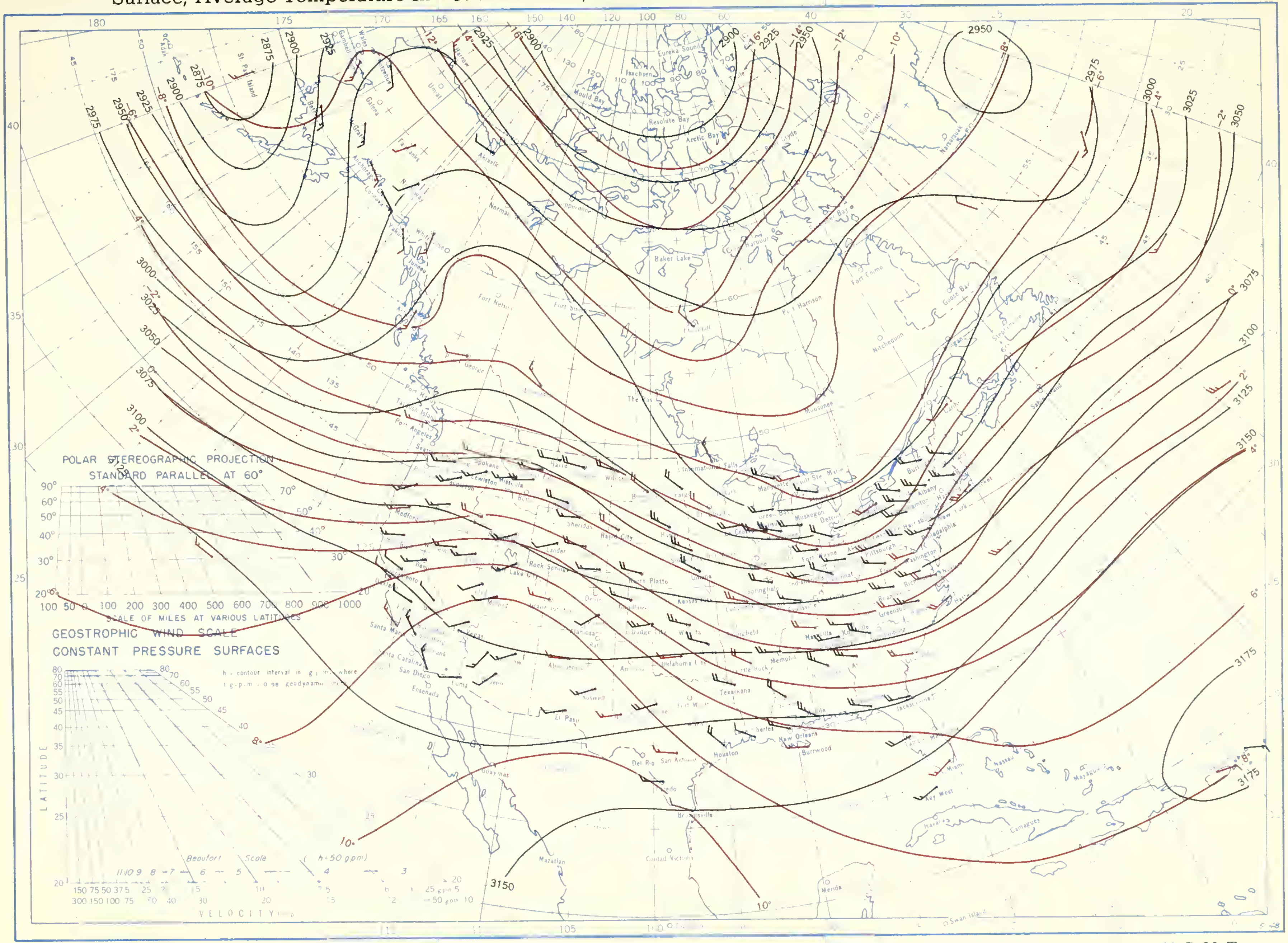
Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), May 1954.



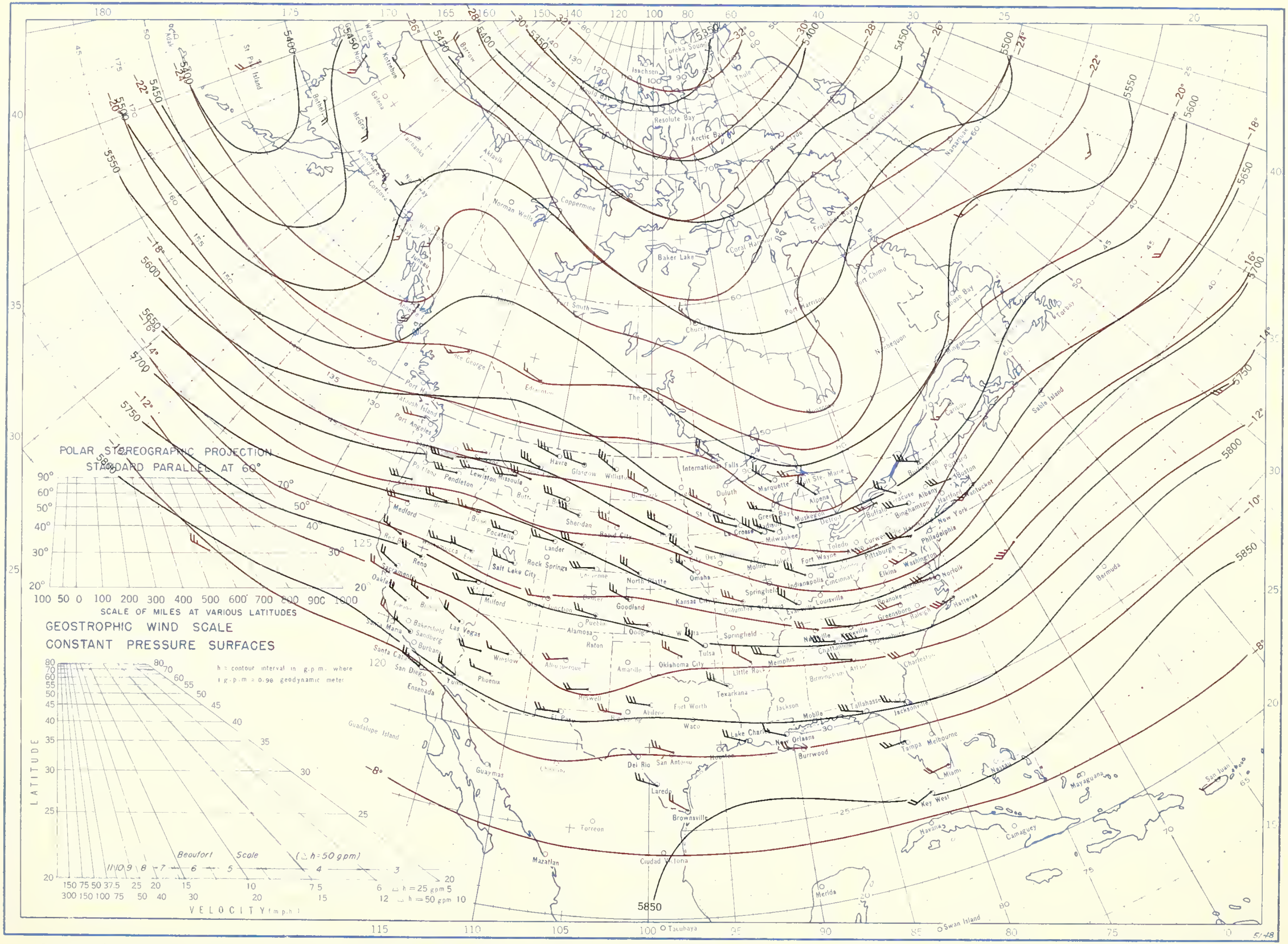
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m.. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), May 1954.



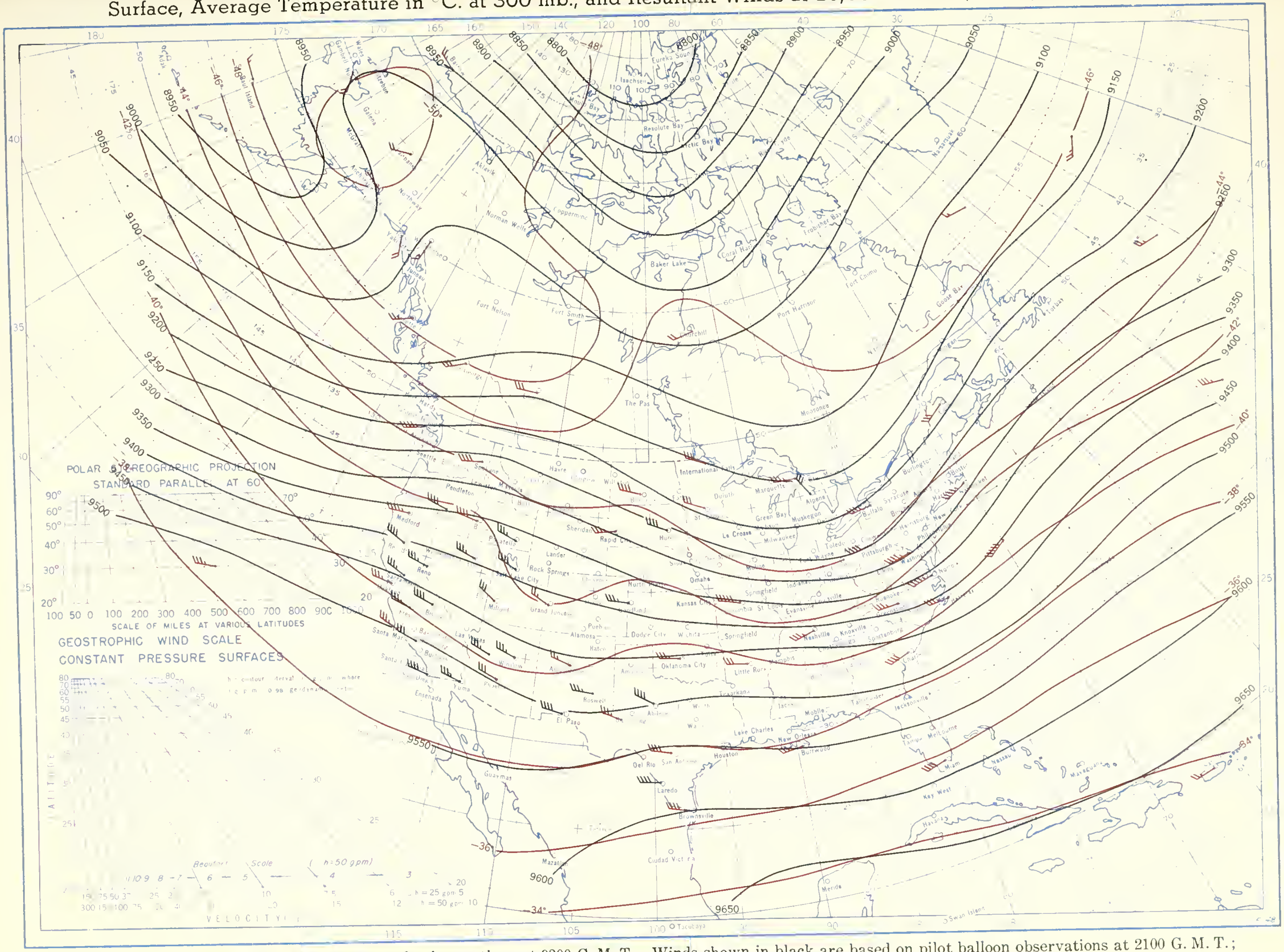
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), May 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 300-mb. Pressure Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), May 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

JUNE 1954
Volume 5 No. 6

ASHEVILLE: 1954

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NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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CLIMATOLOGICAL DATA
NATIONAL SUMMARY

Volume 5 No. 6 JUNE 1954

GENERAL SUMMARY OF WEATHER CONDITIONS

June 1954 was a month of weather constrasts and extremes. During a nationwide cold spell the first week record low temperatures for the season occurred in the South and Northwest, and in the latter area frost and freezing caused extensive but mostly light crop damage. In contrast, temperatures soared to all-time record high levels in parts of the South and Southwest during the last decade. Similarly pronounced were monthly precipitation totals which ranged from the least of record for June at several eastern stations to the record maxima at a few stations in North Dakota. High temperatures and lack of rain in the South during the latter part of the month resulted in continued drought in parts of the Southeast and declining crop conditions in most of the remainder of the South. In the Northwest abnormally cool weather, persisting through most of the month, slowed growth of most crops, but in many areas substantial rainfall, although hampering hay harvest, greatly helped to overcome the effect on crops of subnormal moisture during the preceding 4 months. In other northern sections ample moisture and normal to above normal temperatures after the first week favored rapid crop growth, but frequent showers interfered with grain harvesting and severe storms and floods caused considerable crop damage in the North Central Interior.

The season's first hurricane moving into southern Texas on the 25th and 26th was responsible for heavy rains which caused the greatest Rio Grande flood in history. (See Summary of River and Flood Conditions.)

Thunderstorms during June were unusually numerous in parts of the Northeast and the heavy rainfall areas of the Great Lakes and upper Mississippi Valley. Sault Ste. Marie, Mich., reported 14 thunderstorms, the greatest number ever observed there in any month. Milwaukee, Wis., also reported 14 which was 8 above average and a June record for the station, and Grand Rapids and Detroit, Mich., each had 12, which was twice their long-term average for June.

Sunshine, slightly below normal along the Canadian Border and in most of the far West, was much below in parts of New York and New England, and well above normal elsewhere. While no new sunshine records were set, Providence, R. I., had the second least amount of sunshine for June on record, and Port Arthur, Tex., had the most for this month since June 1936.

PRECIPITATION.--In most of the area from the central and lower Great Plains eastward and northward along the Atlantic Coast to southern New England precipitation was less than 75 percent of normal and most station totals were less than 3 inches. In the central and lower Great Plains, the lower Mississippi Valley, and along the Gulf and Atlantic Coasts rainfall generally was less than half of normal, and along the middle Atlantic Coast less than 10 percent. State averages for North Carolina (1.98 inches), South Carolina (1.85 inches), and Delaware (0.95 inches), were the lowest for June on record. In addition scattered stations in the remainder of this area had the least amount of rainfall for June on record, among which were the following: Savannah, Ga., 0.84 inch; Atlantic City, N. J., 0.28; Norfolk, Va., 0.37; Harrisburg, Pa., 0.58 inch. From southern Mississippi to the Atlantic Coast and thence northward through the Carolinas, precipitation had been below normal in previous months. At Pensacola, Fla., June was the sixth consecutive month with below normal rainfall, and the total for this 6-month period, 11.69 inches, was 17.22 inches below the normal and the least of record, the previous record being 11.81 inches in 1904. Most crops in this driest area were in poor condition due to the prolonged dry spell. In the remainder of the area, although crops were declining, the situation was not yet serious, thanks to helpful rains in May. The dry weather, however, favored harvesting.

Heavy rainfall was rather general over Michigan, Wisconsin, most of Iowa, southern Minnesota, eastern South Dakota, and north central North Dakota, northern Illinois, and was also heavy in relatively small areas of surrounding States. Monthly totals ranged up to 14.38 inches at Britt, Iowa, 13.97 at Belcourt, N. Dak., 10 inches or more in South Dakota, Minnesota, Wisconsin, and Michigan, and 9 inches or over in Nebraska, Kansas, and Missouri. Devils Lake, N. Dak., had 8.55 inches which was a new record there for any month in the year. Flooding, occurring in many streams in these areas of heavy rainfall, was most severe in Iowa, where moderately heavy showers, saturating the soil in the north on the 15th and 16th, were followed by heavy showers from the 18th through the 21st (Britt measured 8.60 inches on the 18th) that totaled from 7 to 12 inches for the 4-day period. Floods resulting from these heavy rains caused estimated losses (mostly to crops) in Iowa of more than $10 million. The heaviest rains in north-central North Dakota fell during the passage of a low pressure area on the 7th. Some stations reported 6-to 8-inch totals during this storm.

The heaviest rainfall of the month occurred in the Rio Grande and Pecos River Valleys of Texas during the 48 hours following the movement inland of the season's first hurricane "Alice" south of Brownsville on the 25th. Rainfall totaling up to 27.1 inches near Pandale resulted in disastrous flooding along the Rio Grande from the Pecos River to Falcon Dam below Laredo. Other heavy rainfall areas included southern Florida and parts of Arizona. The heavy rains in southern Florida, totaling 18.95 inches for the month at Avon Park, interfered with the harvest of late truck crops. Rainfall in Arizona was heaviest in a band reaching across the State from southeast to northwest where a few stations received the greatest June rainfall since 1927. Heaviest rains fell during the period 24th through the 26th when 24 stations, including Florence, Grand Canyon, Prescott, and Sycamore, which have long records, reported a record amount of rain in an observational day for June. The greatest 1-day amount reported was

2.06 inches at Klondyke on the 25th, and the greatest monthly total was 3.03 inches at Mount Lemon.

Some heavy snowfalls occurred. Blue Canyon, Calif., and Stampede Pass, Wash., reported record amounts for June of 8 and 9 inches respectively, and 27 inches fell at Kings Hill, Mont., during the month. Some snow fell in the mountains of northwestern Wyoming on the 1st and 2d, and Meacham Airport, in northeastern Oregon, reported 3 inches of snow on the ground on the 6th.

TEMPERATURE.--East and west of a line running through Pembina, N. Dak., and Yuma, Ariz., temperatures for the month averaged above and below normal respectively, with departures ranging from 4° above normal in the Central Interior to 4° below normal in the Pacific Northwest.

The lowest temperatures of the month occurred during the first week, except from northeastern North Carolina northward through New England and eastern New York where most stations recorded their lowest on the 17th or 18th. Roseburg, Oreg., recorded a June low of 34° on the 6th, and at Dallas, Tex., 53° occurred on the 4th. Frost and freezing extended southward to northern portions of Arizona and New Mexico during the first week when the month's lowest temperature, 13°, was recorded at Climax and Hermit, Colo., on the 2d and 7th respectively.

Rising temperatures east of the Rocky Mountains after the first week and in the far West following the middle of the month reached their peak at most places during the last decade. The top temperature for the month, 125° at Cow Creek, Calif., on the 22d, equaled the highest June temperature for Death Valley and was the second highest June temperature ever recorded in California. The high temperature record for Nevada, 122°, recorded at Leeland in August 1914, was equaled at Overton on the 23d, and in Utah 114° at Zion National Park was only 2° short of the all-time State record. The all-time high for South Carolina, 111°, was equaled at Camden on the 27th, and for Georgia, 110°, at Eastman on the 28th. Stations reporting a record number of consecutive days with 90° or above included Chicago, Ill., 16, Louisville, Ky., 13, and Terre Haute, Ind., 12.

DESTRUCTIVE STORMS.--June storms were responsible for the death of 52 persons, 187 injuries, and crop and property losses totaling more than $30 million.

Tornadoes and hailstorms associated with a line squall which swept across Texas on the first day of the month accounted for more than $7 million damage, $1,000,000 to property and the remainder to crops.

High winds and heavy rains caused losses of $2,000,000 in Minnesota and $1,000,000 in North Dakota on the 7th. Fargo, N. Dak., recorded a new all-time wind speed of 91 m.p.h. for the station, and also a record low pressure there for June of 28.79 inches m.s.l.

Other heavy storm tolls during the month included $1,500,000 hail damage in Tom Green County, Tex., on the 7th; $1,245,000 wind and hail damage in Kansas on the 11th; a million dollar hailstorm in St. Cloud, Minn., and vicinity on the 17th; and a series of hailstorms in North Carolina on the 27th that did $1,060,000 damage.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

JUNE 1954

Section	Temperature								Precipitation					
			Monthly extremes								Monthly extremes			
	Average	Departure from normal	Station	Highest	Date	Station	Lowest	Date	Average	Departure from normal	Station	Greatest	Station	Least
	°F	°F		°F			°F		In.	In.		In.		In
Alabama	79.2	0.7	2 Stations	108	28	2 Stations	43	5	2.08	-2.18	South Hill	7.03	Alberta	0.05
Arizona	74.1	-.3	Littlefield	120	22	Alpine	15	7	.54	.19	Mt. Lemmon	3.03	12 Stations	.00
Arkansas	79.6	2.5	2 Stations	107	°27	Green Mountain	40	5	1.28	-2.03	Lead Hill	4.36	Sparkman	.00
California	68.1	-1.5	Cow Creek	125	22	Twin Lakes	19	°5	.58	.20	Klamath	5.92	96 Stations	.00
Colorado	64.4	2.9	Wray	110	23	2 Stations	13	°2	.64	-.81	Holyoke	4.23	2 Stations	.00
Connecticut	60.7	.6	Kent	93	°21	do	37	17	1.97	-1.55	Brooklyn	4.33	Putnam Lake	.93
Delaware	72.1	.5	Milford	99	13	Georgetown 5SW	41	19	.95	-2.78	Laurel 2SW	2.52	Lewes	.42
Florida	80.7	.7	Quincy Exp. Sta.	106	28	Jasper 9ESE	49	°5	5.73	-.92	Avon Park	18.95	Pensacola CAA AP	.26
Georgia	79.2	.5	Eastman	110	28	3 Stations	41	°5	2.65	-1.76	Brasstown Bald	9.90	Camilla	.23
Idaho	57.3	-3.0	Grand View	105	22	Three Creek	18		2.19	.87	Island Park Dam	5.79	Payette	.55
Illinois	76.3	4.2	Palestine	108	26	Cobden 2S	40	5	3.56	-.46	Cobden 2S	7.97	2 Stations	1.00
Indiana	74.7	3.5	2 Stations	106	°26	Waterloo	36	6	2.91	-1.05	Muncie Walnut St. Br	8.26	Anderson	.98
Iowa	72.9	3.3	do	102	25	Saratoga 2E	36	4	6.36	1.82	Britt	14.38	Centerville	2.17
Kansas	77.0	3.2	Sharon Springs	107	°23	Goodland WB AP	34	3	2.47	-1.50	Morrill	9.74	Meade	.16
Kentucky	75.1	1.1	Hopkinsville	105	27	Hindman Settlement ScL	37	6	3.00	-1.17	Benham	7.92	Freeburn	.42
Louisiana	81.0	.6	Hammond 3NW	105	30	Leesville	48	5	2.07	-2.40	Houma 1	6.80	2 Stations	.00
Maine	61.5	-.1	2 Stations	94	22	Sanford 2NNW	4	18	5.35	1.87	East Sangerville 5S	8.93	Ellsworth	2.15
Maryland	72.0	1.1	7 Stations	100	°26	Princess Anne 1E	37	19	1.73	-2.22	Shallmar	6.58	Conowingo Pol. Brks.	.11
Massachusetts	65.1	-.2	Lowell	95	°21	West Cummington	32	°17	2.90	-.59	Winchendon	5.43	Nantucket WB AP	.72
Michigan	66.5	2.6	2 Stations	97	15	Huron Mountain	26	5	5.13	1.72	Higgins Lake	10.11	Monroe Water Works	2.17
Minnesota	66.0	1.6	Winona	98	25	2 Stations	30	4	3.73	-.36	Austin 4S	11.07	Pokegama Dam	.85
Mississippi	80.5	1.5	Clarksdale	106	28	5 Stations	46	5	1.86	-2.24	Rockport	5.26	Shuqualak	.12
Missouri	77.2	3.9	Union 1SE	108	27	4 Stations	41	°1	3.21	-1.59	Owensville	9.92	Carthage	.51
Montana	56.5	-4.0	Miles City CAA AP	103	22	Dell 19SW	14	2	2.86	.06	Shonkin 7S	12.61	Belfry 8SSW	.54
Nebraska	71.8	2.5	2 Stations	110	24	2 Stations	28	°2	3.59	-.21	Thurston	9.99	McCook	.36
Nevada	64.0	-1.2	Overton	122	23	Wilkins	14	2	.65	.13	Jarbidge	4.01	2 Stations	.00
New Hampshire	63.5	.4	4 Stations	95	°22	2 Stations	33	°17	4.75	1.11	Errol	9.20	Durham	2.62
New Jersey	69.9	.7	Belleplain	98	25	Indian Mills 2W	35	19	1.12	-2.64	Moorestown	2.44	Cape May 3W	.13
New Mexico	70.7	1.0	2 Stations	108	°17	Gavilan	16	7	.49	-.70	Glorieta	3.65	15 Stations	.00
New York	66.3	1.6	Rifton	98	°21	2 Stations	32	°7	3.73	.15	Salem	7.43	Cutchogue	.44
North Carolina	75.1	.3	4 Stations	107	°27	do	31	6	1.98	-2.64	Southern Pines	7.17	Gastonia	.31
North Dakota	61.4	-1.7	2 Stations	96	23	do	31	°1	4.94	1.43	Belcourt Indian Res.	13.97	Oakes	1.40
Ohio	72.0	2.2	Portsmouth	102	27	Mansfield 6W	33	6	3.43	-.51	Galion Water Works	7.61	Gibralter Island	.81
Oklahoma	79.5	1.9	Durant	106	30	Goodwell	39	3	1.58	-2.43	Sulphur	4.34	Spiro	.08
Oregon	56.0	-3.8	Huntington	102	22	Crater Lake NP Hq.	15	1	2.28	.85	Government Camp 2E	9.60	Mitchell	.21
Pennsylvania	60.7	.5	Columbia	101	26	Kane 1NNE	31	7	3.06	-1.04	Blairsville 6ENE	7.66	New Park	.13
Rhode Island	65.3	-.6	Providence WB AP	89	20	Kingston	43	18	1.64	-1.28	Greenville	2.31	Block Island WB AP	1.19
South Carolina	78.5	.6	Camden 2WSW	111	28	3 Stations	44	5	1.85	-2.76	Sumter	8.72	2 Stations	.17
South Dakota	65.2	-.9	Ardmore	110	23	Deerfield Dam	22	3	4.30	.70	Canton	10.96	Mount Coolidge	.88
Tennessee	75.9	.9	3 Stations	105	°27	Crossville Exp. Sta.	39	5	2.54	-1.66	Haw Knob	13.30	Monsanto	.65
Texas	81.1	1.5	Boquillas Ranger Sta.	112	°6	Hereford 1	41	3	1.61	-1.18	Pandale	25.67	Several	.00
Utah	63.7	-.8	Zion NP	114	22	Soldiers Summit	15	7	.83	.13	Cottonwood Weir	2.65	2 Stations	.00
Vermont	63.8	.6	Randolph	95	22	Somerset	34	17	4.53	.81	Rutland	7.96	Vernon	2.20
Virginia	72.4	.5	Halifax	103	27	Burkes Garden	33	6	2.12	-1.98	Kerrs Creek	6.01	Tangier Island	T
Washington	56.8	-4.0	Richland	97	26	Rainier Paradise RS	23	6	2.21	.60	Palmer 3SE	9.74	2 Stations	.14
West Virginia	70.0	.1	Logan	100	27	Cranberry Glades	35	6	3.65	-.86	Pickens 1	8.88	Bluefield 2	.60
Wisconsin	67.7	2.9	2 Stations	98	25	Long Lake Dam	27	5	6.03	1.84	Dodgeville	11.58	Rib Falls	3.01
Wyoming	59.3	.6	do	109	23	2 Stations	20	°2	1.26	-.56	Snake River	4.55	Kaycee 17WNW	.00
Puerto Rico	78.1	.0	Dos Bocas Dam	99	2	Garzas Dam	55	°2	6.42	.46	Toro Negro #2	21.44	Coamo Dam	1.33

° Other dates also.

Note: Dates in Table 1 apply to the period 24 hours prior to time of observation. In some cases the actual occurrence is on the calendar date preceding that shown. (See individual Climatological Data for times of observation).

Table 2

State and station	Elevation (ground) Ft.	Pressure: Station Mb.	Pressure: Sea level Mb.	Temperature: Average maximum °F	Temperature: Average minimum °F.	Temperature: Average °F.	Temperature: Departure from normal °F.	Temperature: Highest °F.	Temperature: Date	Temperature: Lowest °F.	Temperature: Date	No. of days: Max. 90° F. or above	No. of days: Min. 32° F. or below	Average dew point °F.	Average relative humidity %	Precipitation: Total In.	Precipitation: Departure from normal In.	Precipitation: Greatest in 24 hours In.	No. of days: .01 inch or more	No. of days: With thunderstorms	Snow, Sleet, Hail: Total In.	Snow, Sleet, Hail: Max. depth on ground In.	Wind: Average hourly speed M. p. h.	Wind: Prevailing direction	Fastest mile: Speed M. p. h.	Fastest mile: Direction	Fastest mile: Date	No. of days (sunrise to sunset): Clear 0–3	Partly cloudy 4–7	Cloudy 8–10	Sky cover, tenths (sunrise to sunset) 0–10	Possible sunshine %
ALABAMA																																
Birmingham	610	990.9	1015.7	92	67	79.2	1.8	102	°28	49	5	20	0	64	63	1.93	-2.28	1.35	6	7	T	T	4.6	NE	43	SW	2	15	13	2	3.6	85
Mobile	211	1008.1	1016.1	93	70	81.3	1.7	102	29	59	5	24	0	70	75	1.94	-4.15	.54	15	13	.0	0	9.3	S	--	---	--	12	17	1	4.2	--
Montgomery CO	201	------	------	93	71	82.3	2.1	103	28	56	5	23	0	--	--	1.33	-3.16	.48	7	9	.0	0	----	---	--	---	--	--	--	--	---	--
Montgomery	198	1008.1	1015.3	94	70	82.0	2.4	105	28	53	5	25	0	66	62	1.55	-3.14	.51	7	11	.0	0	6.6	NE	26	SW	3	13	15	2	3.6	79
ARIZONA																																
Flagstaff	6993	------	------	76	41	58.4	.1	94	22	24	7	2	5	--	--	1.17	.64	1.06	3	4	.0	0	----	---	--	---	--	22	5	3	2.4	--
Phoenix	1114	969.2	1007.1	100	70	84.7	.8	111	°20	57	8	29	0	34	48	.02	-.04	.02	1	1	.0	0	6.4	W	*25	SE	30	24	5	1	1.7	95
Prescott	5014	845.6	1009.5	85	53	69.0	-1.1	102	22	38	°7	9	0	--	--	.70	.47	.44	3	4	.0	0	8.9	SSW	34	S	8	21	6	3	2.4	92
Tucson	2558	921.4	1007.0	98	68	83.1	1.0	108	°19	54	7	28	0	34	21	1.46	1.16	1.27	2	2	.0	0	7.3	WSW	32	SE	24	24	3	3	2.0	96
Winslow	4880	849.3	1007.0	90	54	71.8	.4	103	22	36	7	16	0	28	23	.51	.22	.50	3	3	.0	0	10.3	WSW	*39	SSW	24	22	6	2	2.3	--
Yuma	199	1001.7	1006.7	102	70	85.8	-2.0	115	20	57	10	29	0	41	24	T	-.01	T	0	0	.0	0	10.6	S	30	S	24	25	3	2	1.5	96
ARKANSAS																																
Fort Smith	458	997.0	1013.5	93	68	80.4	2.1	102	°25	50	4	21	0	65	64	.38	-3.93	.22	3	6	.0	0	6.9	NE	40	W	8	20	5	5	3.5	79
Little Rock	257	1001.4	1014.2	94	71	82.3	3.8	104	27	54	5	25	0	65	60	.63	-2.80	.63	1	4	.0	0	7.8	SSW	30	NW	3	16	11	3	3.8	86
Texarkana	361	1001.4	1014.5	92	70	80.9	1.0	99	2[illegible]	54	4	23	0	68	65	.59	-3.26	.40	[illegible]	5	.0	0	----	---	--	---	--	16	11	3	3.5	--
CALIFORNIA																																
Bakersfield	489	993.9	1011.7	90	60	74.6	-2.3	109	°21	45	10	14	0	46	39	T	-.09	T	0	0	.0	0	7.9	NW	*25	NNW	°9	23	6	1	2.0	--
Bishop	4108	869.6	1007.8	90	50	70.0	.6	109	22	32	10	18	1	--	--	.02	-.08	.02	1	1	.0	0	----	---	--	---	--	18	7	5	3.0	--
Blue Canyon	5280	838.5	1012.5	65	47	55.9	-3.1	87	°20	30	5	0	4	--	--	2.21	1.17	.92	7	2	8.0	3	----	---	--	---	--	15	6	9	4.6	--
Burbank	699	986.1	1012.2	78	57	67.5	.0	94	20	49	10	1	0	54	64	.05	-.02	.04	2	0	.0	0	6.0	S	*18	N	°6	12	11	7	4.4	--
Eureka CO	43	1015.9	1010.3	59	50	54.5	-1.1	68	19	44	°1	0	0	--	--	2.57	1.91	1.36	13	0	.0	0	7.3	---	27	N	1	3	12	15	7.1	50
Fresno	331	999.3	1011.1	87	57	71.7	-4.0	108	22	46	°6	10	0	46	45	.29	.18	.29	2	0	.0	0	8.2	NW	29	NW	4	23	5	2	2.2	94
Los Angeles CO	312	------	------	76	59	67.6	-.2	86	20	53	10	0	0	55	70	.08	.01	.08	1	0	.0	0	5.6	---	22	W	°5	15	9	6	4.3	70
Los Angeles	99	1008.5	1012.3	71	59	65.0	.3	77	7	52	10	0	0	56	75	.01	-.06	.01	1	0	.0	0	7.3	WSW	*32	W	6	8	14	8	5.4	--
Mt. Shasta	3543	891.0	1014.2	71	43	57.0	-2.8	90	°22	31	4	2	2	--	--	1.19	-1.04	.51	7	2	T	0	----	---	--	---	--	10	10	10	5.5	--
Oakland	3	1014.2	1014.7	70	53	61.3	-.3	91	21	46	6	1	0	50	71	.11	-.04	.05	4	0	.0	0	8.6	W	*27	W	15	13	9	8	4.3	--
Red Bluff	341	999.7	1012.0	87	59	73.1	-2.9	109	21	47	6	10	0	43	39	.83	.37	.54	7	2	.0	0	10.2	SSE	33	SE	°3	12	10	8	4.5	79
Sacramento	17	1010.8	1012.0	85	54	69.4	-.9	105	21	45	°5	9	0	48	52	T	-.11	T	0	0	.0	0	10.3	SW	31	SW	8	18	7	5	3.0	83
Sandberg CO	4517	861.5	1011.7	74	51	62.7	-2.1	96	21	35	5	4	0	--	--	T	-.04	T	0	0	.0	0	----	---	--	---	--	24	5	1	1.9	--
San Diego	19	1009.1	1012.4	70	60	65.0	-.6	74	°7	54	°6	0	0	56	74	.03	-.01	.02	2	0	.0	0	6.4	SSW	18	SW	12	7	11	12	6.0	50
San Francisco CO	52	------	------	65	52	58.5	-.6	89	21	50	°3	0	0	--	--	.14	-.01	.07	4	0	.0	0	11.1	---	34	W	30	14	9	7	4.2	80
San Francisco	1	1013.5	1014.3	68	50	58.8	-.9	87	21	43	1	0	0	50	78	.15	.02	.11	3	0	.0	0	16.3	WNW	41	WNW	°19	12	8	10	4.3	--
Santa Maria	231	1005.1	1013.3	71	47	58.6	-1.5	82	20	38	6	0	0	49	73	.04	-.10	.04	1	0	.0	0	7.8	W	*25	WNW	5	20	9	1	2.7	--
COLORADO																																
Alamosa	7534	772.1	1012.8	80	41	60.8	2.2	91	24	26	7	5	5	--	--	.03	-.46	.03	2	2	.0	0	----	---	--	---	--	17	9	4	3.1	--
Colorado Springs	6173	809.3	1008.6	84	52	67.9	2.4	100	°23	34	3	5	0	34	35	3.67	1.90	3.09	5	5	T	T	14.1	SSE	*55	SSW	29	20	9	1	2.8	--
Denver	5292	835.1	1007.7	85	53	69.3	2.9	102	23	34	3	11	0	35	35	.66	-.98	.32	7	9	T	T	12.0	S	40	NW	6	10	16	4	4.7	80
Grand Junction	4849	856.1	1008.3	86	56	71.1	-.1	102	23	38	°2	11	0	30	25	.39	-.06	.33	4	4	T	T	11.4	ESE	49	NW	°6	13	11	6	4.3	76
Pueblo	4639	853.0	1007.3	91	58	74.3	5.2	105	23	43	3	18	0	40	35	.55	-.85	.46	4	7	.0	0	10.6	SE	59	NW	6	20	9	1	2.8	91
CONNECTICUT																																
Bridgeport	7	1013.2	------	76	60	68.7	1.8	89	25	50	1[illegible]	0	0	--	--	1.53	-1.94	.57	[illegible]	3	.0	0	----	---	--	---	--	10	8	12	5.5	--
Hartford	15	1007.8	1012.1	80	58	68.6	.9	91	25	46	°1[illegible]	3	0	57	7[illegible]	2.05	-1.71	.45	11	6	.0	0	7.6	S	26	SW	1	9	6	15	6.2	70
New Haven	6	1009.1	1012.9	76	58	66.8	1.0	88	25	47	°1[illegible]	0	0	--	--	1.52	-2.29	.35	11	5	.0	0	6.6	---	25	SW	6	8	7	15	6.3	61
DELAWARE																																
Wilmington	73	1010.8	1014.1	84	60	72.0	.2	94	26	50	1[illegible]	9	0	57	63	.44	-3.58	.20	5	7	.0	0	9.2	S	--	---	--	12	11	7	4.8	--
DIST. OF COLUMBIA																																
Washington CO	72	------	------	85	65	75.0	1.1	99	26	54	19	9	0	--	--	2.29	-1.13	1.37	6	5	.0	0	7.3	---	34	NW	26	--	--	--	---	--
Wash. Nat'l AP	14	1010.5	1014.6	84	64	74.4	1.0	100	26	54	6	7	0	59	61	1.24	-2.17	.74	5	5	.0	0	10.2	WNW	57	NW	26	7	17	6	5.4	74
FLORIDA																																
Apalachicola CO	13	1013.9	1015.2	87	73	80.1	.2	92	°29	62	5	6	0	--	--	6.01	.54	5.01	8	13	.0	0	7.4	---	27	N	18	16	11	3	3.3	81
Daytona Beach	31	1014.2	1015.8	89	71	80.1	1.0	99	28	64	5	13	0	72	79	2.35	-4.34	1.10	7	10	.0	0	9.7	ENE	*30	W	4	11	10	9	5.2	--
Fort Myers	15	1014.9	1015.3	90	72	80.7	.1	95	°30	68	13	18	0	73	83	4.78	-4.42	1.86	12	19	.0	0	6.3	NE	*23	NE	17	5	17	8	6.2	--
Jacksonville CO	18	------	------	91	73	82.0	1.8	101	28	61	5	18	0	--	--	2.89	-3.78	.73	9	--	.0	0	----	---	--	---	--	--	--	--	---	--
Jacksonville	24	1014.9	1015.5	93	72	82.1	1.8	103	28	58	5	23	0	69	71	3.26	-3.56	1.37	9	8	.0	0	9.4	WSW	44	W	10	8	15	7	5.0	61
Key West CO	9	1014.2	1014.9	89	76	82.5	-.1	93	30	72	15	14	0	74	78	5.28	1.27	3.48	12	12	.0	0	----	---	25	E	14	3	13	14	6.8	73
Lakeland CO	214	------	------	90	72	80.9	.8	95	°30	66	4	16	0	--	--	5.67	-2.44	2.72	16	14	.0	0	5.7	---	--	---	--	3	16	11	6.5	50
Miami CO	8	------	------	85	74	79.8	-.5	89	°30	69	4	0	0	--	--	11.21	5.66	3.40	17	16	.0	0	8.4	---	32	NW	16	7	11	12	6.1	57
Miami	8	1014.2	1015.1	88	74	81.2	-.1	92	°30	71	4	11	0	73	80	10.14	3.32	1.79	19	17	.0	0	7.6	SW	*22	WSW	4	4	9	17	6.8	--
Miami Beach	9	------	------	86	76	81.0	-.5	91	°27	69	[illegible]	6	0	--	--	11.03	6.00	3.22	16	--	.0	0	----	---	--	---	--	7	5	1[illegible]	---	--
Orlando	106	1011.5	1015.5	91	72	81.1	.3	97	°27	66	4	18	0	71	78	5.81	-2.04	2.21	11	10	.0	0	8.4	WSW	*32	NW	°4	[illegible]	11	11	5.8	--
Pensacola CO	13	1013.2	------	88	74	80.9	1.3	97	27	62	[illegible]	11	0	--	--	.83	-4.34	.43	4	4	.0	0	----	---	23	NW	24	--	--	--	---	83
Pensacola CAA AP	118	------	1015.3	--	--	----	---	--	--	--	--	--	--	61	73	-----	----	----	--	--	---	--	8.0	S	--	---	--	--	--	--	---	--
Tallahassee	64	1012.9	1015.4	92	70	80.8	1.1	100	28	58	°6	23	0	68	73	5.26	-1.46	2.02	12	14	T	T	4.7	NE	--	---	--	6	19	5	5.1	--
Tampa	19	1013.9	1015.5	89	72	80.4	.0	94	9	65	6	11	0	72	79	4.57	-3.20	2.18	12	17	.0	0	7.5	W	*34	WNW	4	4	19	7	5.5	75
West Palm Beach	15	1014.2	1015.0	88	73	80.5	-.1	97	11	67	4	10	0	73	83	13.57	5.68	4.87	17	16	T	T	6.9	ESE	*30	SW	4	6	9	15	6.8	--
GEORGIA																																
Albany	190	1008.1	1015.2	95	70	82.3	1.0	104	28	55	5	27	0	66	64	3.88	-1.00	1.94	8	11	T	0	3.8	SW	--	---	--	9	17	4	4.8	--
Atlanta	977	975.6	1016.2	89	67	78.0	.3	100	°28	50	5	16	0	62	63	2.08	-1.94	1.18	6	6	.0	0	7.2	NW	38	SW	15	13	13	4	4.1	81
Athens	798	987.1	------	91	65	78.1	-.8	104	27	49	5	22	0	--	--	2.81	-1.03	1.19	7	10	.0	0	----	---	--	---	--	15	12	3	3.9	--
Augusta	143	1008.5	1015.0	92	65	78.7	-1.3	103	27	51	5	23	0	66	69	3.52	-.22	1.32	7	7	T	0	5.7	SE	*32	NNW	1	14	10	6	4.0	--
Columbus	385	1001.7	1015.6	93	67	79.9	.9	103	28	48	5	24	0	--	--	1.56	-2.39	.88	4	9	.0	0	----	---	--	---	--	15	14	1	3.6	--
Macon	356	1001.4	1014.5	95	69	81.9	1.0	106	28	51	5	25	0	63	56	.99	-2.76	.66	6	8	.0	0	8.3	NW	56	NW	3	17	12	1	3.3	90
Rome	637	993.2	1015.9	90	62	75.9	-1.5	102	27	45	5	19	0	--	--	4.90	.83	2.14	8	11	.0	0	----	---	--	---	--	16	10	4	3.8	--
Savannah	43	1012.9	1015.2	91	69	80.1	.4	103	27	55	5	18	0	68	69	.84	-4.33	.34	6	6	.0	0	8.6	SE	28	NW	10	13	14	3	4.4	77
Valdosta	200	1007.1	1015.2	96	69	82.1	2.1	104	28	53	6	27	0	69	--	4.63	-.48	1.97	8	11	.0	0	8.1	SW	--	---	--	10	17	3	4.5	--
IDAHO																																
Boise	2842	916.7	1011.8	74	48	61.3	-3.8	99	25	35	2	4	0	41	52	1.10	.26	.41	6	2	T	0	9.8	NW	40	S	30	9	8	13	5.7	76
Idaho Falls, 46 W, CO	4933	845.9	1011.9	72	41	56.2	---	95	°22	26	2	4	5	--	--	2.74	----	1.73	8	1	T	T	11.4	WSW	&35	WSW	°6	--	--	--	---	--
Idaho Falls, 43 NW, CO	4780	------	------	72	41	56.8	---	97	°22	28	7	5	5	--	--	1.57	----	.60	8	0	.0	--	7.2	SSW	&30	SW	16	--	--	--	---	--
Lewiston	1413	961.7	1012.8	73	48	60.8	-5.5	90	25	38	2	1	0	--	--	2.21	.46	.51	11	3	.0	0	----	---	--	---	--	2	12	16	7.1	--
Pocatello	4444	860.5	1011.4	74	46	60.0	-3.0	99	22	32	[illegible]	5	1	36	47	1.48	.46	.62	1[illegible]	5	T	0	11.8	SW	46	W	6	7	7	16	6.2	54
ILLINOIS																																
Cairo CO	314	1001.7	------	91	70	80.4	2.6	104	27	52	5	23	0	--	--	3.87	.03	2.32	9	10	.0	0	6.7	---	34	NW	9	12	15	3	4.3	83
Chicago	610	990.2	1012.5	86	65	75.7	6.3	100	25	49	3	16	0	61	63	4.27	.12	1.34	11	9	T	0	9.2	S	41	NW	1	4	16	10	6.2	70
Moline	589	991.5	1013.2	85	64	74.6	3.8	98	25	47	4	13	0	63	68	5.10	.47	1.74	9	8	T	0	8.7	SW	36	W	21	6	14	10	5.7	69
Peoria	654	991.2	1013.4	86	65	75.5	4.6	97	°25	48	4	14	0	63	66	6.35	2.47	1.77	9	8	T	0	9.6	---	47	SW	7	7	16	7	5.6	76
Springfield	587	990.5	1013.4	88	66	77.0	5.1	103	26	48	5	16	0	63	65	3.95	-.23	1.28	10	11	.0	0	11.0	S	49	S	13	7	14	9	5.6	74

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure: Station	Pressure: Sea level	Temperature: Average maximum	Temperature: Average minimum	Temperature: Average	Temperature: Departure from normal	Temperature: Highest	Temperature: Date	Temperature: Lowest	Temperature: Date	Temperature: No. of days: Max. 90° F. or above	Temperature: No. of days: Min. 32° F. or below	Average dew point	Average relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Greatest in 24 hours	Precipitation: No. of days: .01 inch or more	Precipitation: No. of days: With thunderstorms	Snow, Sleet, Hail: Total	Snow, Sleet, Hail: Max. depth on ground	Wind: Average hourly speed	Wind: Prevailing direction	Wind: Fastest mile: Speed	Wind: Fastest mile: Direction	Wind: Fastest mile: Date	No. of days (sunrise to sunset): Clear	No. of days (sunrise to sunset): Partly cloudy	No. of days (sunrise to sunset): Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M p. h.		M p. h.			0–3	4–7	8–10	0–10	%
INDIANA																																
Evansville	383	1000.0	1015.4	90	65	77.7	3.1	104	26	45	5	21	0	63	64	1.35	-2.52	.91	5	7	.0	0	7.4	SSW	38	S	14	13	11	6	4.7	82
Fort Wayne	001	983.1	1013.8	86	61	73.3	4.3	95	14	41	5	14	0	60	67	2.19	-1.37	.65	9	8	.0	0	10.3	SW	45	S	3	5	14	11	6.4	74
Indianapolis	793	985.8	1014.7	87	64	75.5	4.1	102	26	44	5	18	0	61	63	1	-3.06	.80	5	10	.0	0	11.1	SW	38	NW	1	8	13	9	5.6	69
South Bend	768	986.1	1013.8	83	61	71.7	3.0	93	°11	40	5	7	0	61	71	1.6[illegible]	-2.14	.50	12	10	.0	0	9.7	SSW	•38	SSE	1	5	13	12	6.3	--
Terre Haute	578	993.6	1014.3	88	64	76.1	3.6	103	26	45	5	18	0	62	62	2.57	-1.80	1.00	7	7	.0	0	8.5	S	42	SW	15	10	11	9	5.3	73
IOWA																																
Burlington	694	988.5	1013.6	86	65	75.3	3.6	100	°25	46	4	15	0	63	68	2.97	-2.67	.66	11	11	T	T	9.9	SSW	32	N	21	7	13	10	5.6	82
Des Moines	948	901.4	1012.6	85	64	74.5	3.9	99	25	44	4	11	0	63	71	5.30	.31	2.12	12	11	T	T	12.8	S	65	SE	12	9	12	9	5.6	70
Dubuque	1065	974.6	1013.4	81	61	71.2	3.4	94	25	45	4	3	0	62	71	8.14	3.05	3.51	12	10	T	T	----	---	--	---	--	6	10	14	6.6	--
Sioux City	1094	969.9	1010.2	83	62	72.7	2.4	101	24	42	4	5	0	60	67	6.81	2.40	3.57	9	7	.0	0	12.1	S	52	NW	19	8	9	13	5.8	64
KANSAS																																
Concordia CO	1375	961.4	------	88	66	77.2	3.3	102	25	44	4	19	0	--	57	2.36	-1.87	1.17	7	9	.0	0	9.8	---	30	NW	2	16	10	4	3.6	79
Dodge City	2594	921.1	1008.4	91	64	77.5	4.0	102	23	41	3	22	0	55	51	.79	-2.22	.55	5	7	T	T	18.5	S	54	S	10	16	12	2	3.0	83
Goodland	3645	883.8	1007.7	90	56	73.0	4.5	106	°23	34	3	17	0	47	48	1.78	-1.24	.90	5	8	T	T	12.8	S	•45	WNW	6	17	10	3	3.5	--
Topeka	879	982.7	1012.0	89	66	77.1	3.3	101	°25	47	4	18	0	63	64	3.78	-.76	1.58	6	8	T	0	12.1	SSE	45	NW	11	11	12	7	4.6	71
Wichita	1321	963.4	1010.9	91	66	78.5	3.2	103	°24	44	4	19	0	60	56	.94	-4.05	.69	5	6	.0	0	15.3	S	36	N	12	16	10	4	3.8	90
KENTUCKY																																
Lexington	979	980.4	1015.4	87	63	75.2	3.0	101	26	47	5	14	0	61	64	2.14	-2.07	.63	12	11	.0	0	9.1	SSW	--	---	--	8	16	6	5.1	--
Louisville CO	457	------	------	87	68	77.8	2.9	100	26	50	5	18	0	--	--	1.51	-2.54	.64	7	6	.0	0	----	---	--	---	--	--	--	--	---	--
Louisville	474	998.3	1014.3	90	65	77.3	3.1	101	26	47	5	20	0	62	62	.81	-3.25	.57	4	6	.0	0	7.0	SW	38	W	16	14	10	6	4.5	80
LOUISIANA																																
Baton Rouge	64	1012.2	1015.0	92	71	81.5	1.9	103	30	55	5	24	0	70	72	2.93	-2.09	1.10	7	10	.0	0	6.6	W	--	---	--	10	17	3	4.5	--
Lake Charles	12	1013.5	1015.0	90	71	80.9	.2	98	30	60	5	19	0	72	74	1.78	-3.27	1.03	5	6	.0	0	7.4	S	•25	ESE	2[illegible]	8	21	1	4.7	--
New Orleans CO	9	1013.5	------	91	75	82.7	.8	102	30	67	5	19	0	--	--	6.10	-.47	2.08	10	11	.0	0	5.5	---	21	E	12	11	16	3	4.6	74
New Orleans	3	1013.2	1015.2	90	72	80.9	.4	100	30	60	5	18	0	71	77	3.16	-2.47	2.20	10	12	.0	0	7.3	S	•23	NNE	4	14	13	3	4.3	--
Shreveport	252	1005.4	1014.8	93	71	81.7	.6	100	28	58	4	24	0	70	69	1.88	-.76	1.46	4	6	T	T	8.0	S	--	---	--	13	14	3	3.9	86
MAINE																																
Caribou	624	990.5	1013.5	69	50	59.4	1.0	86	22	40	1	0	0	50	74	5.62	1.67	1.64	13	4	.0	0	8.5	NW	•50	SW	22	5	7	18	7.2	--
Portland	61	1008.8	1012.9	71	52	61.3	-.5	91	°22	39	18	2	0	55	80	3.52	.20	1.04	14	4	.0	0	7.2	E	24	E	2[illegible]	4	12	14	6.9	51
MARYLAND																																
Baltimore CO	14	------	------	84	67	75.2	.9	98	2[illegible]	56	6	4	0	--	--	.37	-3.15	.17	5	--	---	--	----	---	--	---	--	--	--	--	---	--
Baltimore	146	1010.2	1014.9	84	61	72.4	.2	99	2[illegible]	48	19	6	0	56	60	.15	-3.37	.05	6	4	.0	0	9.[illegible]	NW	35	NW	27	10	15	5	5.0	75
Frederick	294	------	------	85	59	71.8	-.8	100	2[illegible]	45	7	8	0	--	-	1.45	-2.51	.81	9	--	.0	0	----	---	--	---	--	--	--	--	---	--
MASSACHUSETTS																																
Blue Hill Obs.	636	990.1	1013.2	73	55	63.5	-.5	87	°21	46	°18	0	0	--	77	2.8[illegible]	-1.2[illegible]	1.24	13	5	.0	0	12.2	NE	38	SSW	1	9	7	14	6.1	53
Boston	15	1008.5	1013.1	74	59	66.6	-.[illegible]	93	°21	49	18	3	0	55	72	2.78	-.7[illegible]	.79	12	4	.0	0	11.3	E	30	SW	1	8	9	13	6.3	58
Nantucket	43	1012.9	1013.[illegible]	67	55	61.1	.2	81	27	46	17	0	0	56	86	.72	-2.52	.26	6	6	.0	0	11.7	WSW	29	NW	27	8	9	13	6.0	70
Pittsfield	1153	------	------	74	53	63.3	.3	87	°22	40	17	0	0	--	--	4.03	-.5[illegible]	1.67	13	4	T	0	----	---	--	---	--	--	--	--	---	--
MICHIGAN																																
Alpena CO	587	991.2	------	71	55	62.8	1.3	90	13	43	4	1	0	--	--	3.61	1.06	.77	16	11	.0	0	9.3	---	26	E	°12	5	11	14	6.7	63
Detroit	619	987.8	1013.8	81	61	71.3	3.2	93	12	43	5	7	0	59	67	2.97	.07	.74	12	10	.0	0	9.4	S	45	W	12	4	13	13	6.9	68
Detroit (Willow Run)	722	985.8	1013.5	82	61	71.6	3.0	96	15	42	5	8	0	59	70	3.41	.15	1.40	11	12	.0	0	9.2	SW	•40	NW	12	2	15	13	6.9	--
Escanaba CO	594	990.9	------	70	55	62.4	1.7	86	30	43	°2	0	0	--	--	4.08	1.28	1.09	13	11	T	T	9.7	---	34	N	4	7	10	13	6.0	63
Grand Rapids	681	988.5	1013.2	81	59	70.0	3.3	92	25	38	°5	5	0	60	72	2.87	-.48	1.39	12	12	.0	0	8.5	W	31	SW	21	5	10	15	7.0	60
Lansing	859	982.4	1013.9	80	59	69.8	2.4	92	15	39	5	4	0	60	74	4.07	.70	1.15	13	11	.0	0	8.6	WNW	51	W	25	5	13	12	6.3	64
Marquette CO	677	986.1	------	73	52	62.3	2.7	90	24	41	4	1	0	--	--	3.23	-.23	.94	15	9	.0	0	7.5	---	31	S	18	6	8	16	6.5	64
Muskegon	627	990.5	1013.5	79	58	68.8	4.4	91	°16	39	6	5	0	59	68	4.83	1.96	2.47	10	11	.0	0	----	---	--	---	--	6	12	12	6.4	--
Sault Ste. Marie	721	991.2	1013.8	71	49	59.7	1.6	03	13	38	°6	0	0	54	81	4.72	1.70	1.00	18	14	.0	0	8.4	WNW	31	SW	24	6	7	17	6.8	46
MINNESOTA																																
Duluth	1409	971.2	1012.3	72	51	61.5	1.8	87	29	37	4	0	0	51	72	4.10	.23	1.35	9	6	.0	0	12.2	E	41	SW	°7	4	12	14	6.9	59
Intern'l Falls	1179	968.8	1011.4	74	50	61.7	1.6	85	24	35	4	0	0	51	68	2.84	-.89	.77	14	9	.0	0	9.4	---	--	---	--	3	12	15	7.1	--
Minneapolis	830	978.7	1011.7	81	61	71.2	3.0	92	11	44	4	4	0	57	64	4.71	.45	2.53	14	10	.0	0	12.2	SE	•45	SW	7	4	15	11	6.2	56
Rochester	1017	975.3	1011.8	80	60	70.0	3.2	94	24	39	4	4	0	59	69	6.26	1.93	2.45	14	13	T	0	10.0	SE	--	---	--	7	11	12	6.2	--
St. Cloud	1034	973.6	1011.2	77	56	66.7	1.7	88	23	39	5	0	0	56	70	6.90	3.05	2.97	14	11	T	0	6.9	SE	--	---	--	5	11	14	6.6	--
MISSISSIPPI																																
Jackson	315	1003.4	1015.2	94	70	82.1	2.2	102	29	55	°5	26	0	68	66	2.10	-1.62	.84	5	13	.0	0	6.1	SSE	40	NE	28	14	16	0	3.7	82
Meridian	294	1013.2	------	94	69	80.7	1.6	102	28	50	5	25	0	--	-	3.08	-1.25	1.30	7	7	.0	0	----	---	--	---	--	16	13	1	3.5	--
Vicksburg CO	234	1006.1	------	91	72	81.4	1.9	98	30	58	4	22	0	--	--	1.25	-2.06	.44	6	6	.0	0	7.2	---	25	E	°19	13	16	1	3.9	85
MISSOURI																																
Columbia	778	985.1	1013.1	88	66	77.2	4.3	102	26	49	4	17	0	63	66	2.42	-2.48	1.10	8	11	.0	0	8.5	SSE	34	NW	°1	9	15	6	5.0	81
Kansas City	741	978.7	1012.5	89	70	79.2	3.8	102	26	51	4	18	0	62	58	3.64	-1.38	1.50	8	5	.0	0	11.2	S	47	N	9	10	13	7	4.8	77
St. Joseph	809	977.7	1011.8	88	66	77.1	2.7	101	26	48	4	17	0	62	59	4.15	-2.31	1.15	10	9	T	0	11.5	---	59	NW	21	11	12	7	4.5	81
St. Louis CO	465	993.6	------	89	70	79.6	3.8	101	26	53	4	19	0	--	--	2.75	-1.05	.06	10	12	.0	0	11.5	---	42	SW	15	13	12	5	4.6	78
St. Louis	552	993.6	1013.8	90	60	79.4	4.3	102	°25	51	4	20	0	63	60	2.71	-1.66	.58	10	10	.0	0	8.5	S	--	---	--	10	12	8	5.2	--
Springfield	1265	967.2	1013.7	89	66	77.3	4.4	101	27	46	4	19	0	63	65	1.10	-4.46	.73	5	6	.0	0	11.8	S	38	SW	15	12	11	7	4.7	82
MONTANA																																
Billings	3568	887.9	1010.2	73	49	60.9	-3.1	96	22	40	°2	2	0	45	59	1.25	-1.36	.32	12	3	.0	0	11.4	NE	49	NW	24	8	11	11	6.0	65
Glasgow CO	2090	936.7	1010.4	73	49	61.1	-3.1	96	22	39	18	2	0	44	61	2.04	-1.44	1.27	7	3	.0	0	----	---	--	---	--	4	8	18	7.4	--
Great Falls	3664	885.5	1011.2	67	47	56.0	-3.9	90	22	36	1	1	0	38	57	4.71	1.75	2.11	15	3	T	0	15.5	WSW	50	W	17	6	11	13	6.6	62
Havre CO	2488	922.5	1010.5	70	48	59.2	-3.7	95	22	42	°3	2	0	--	--	2.07	-.91	.78	14	5	.0	0	10.2	---	33	W	16	5	11	14	6.8	46
Helena	3893	871.0	1012.1	67	45	55.7	-3.7	92	22	34	17	1	0	39	58	2.15	.00	.84	9	6	.0	0	9.3	W	47	SW	28	6	8	16	6.7	64
Kalispell	2965	------	------	66	43	54.7	-3.7	85	22	33	°6	0	0	--	--	1.98	-.45	.70	14	2	T	T	----	--	--	---	--	2	14	14	7.3	--
Miles City	2629	927.2	1010.8	76	48	62.2	-3.0	103	22	37	°2	2	0	48	--	2.52	-.32	1.20	11	6	T	T	11.0	NW	--	---	--	5	11	14	6.3	--
Missoula	3200	899.8	1013.6	68	43	55.7	-4.5	91	22	33	°17	1	0	40	60	2.42	.55	.64	12	5	T	0	6.8	NW	38	W	15	5	6	19	7.2	50
NEBRASKA																																
Grand Island	1841	944.8	1009.6	86	61	73.9	2.3	102	25	38	4	12	0	58	61	5.13	1.47	2.34	6	8	T	T	14.3	S	--	---	--	12	10	8	4.4	--
Lincoln CO	1184	------	------	87	65	75.9	3.1	103	25	45	4	14	0	--	--	3.65	-.45	1.72	0	11	T	0	10.3	---	36	W	°7	11	13	6	4.9	01
Norfolk	1544	955.3	1010.0	84	61	72.1	2.8	100	24	40	4	9	0	59	64	4.51	-.27	2.58	8	12	T	T	----	---	--	---	--	9	10	11	5.5	--
North Platte	2779	911.6	1008.1	86	57	71.3	2.5	106	24	38	1	9	0	54	61	1.57	-1.35	.55	6	9	T	0	15.3	SE	47	NW	2	7	19	4	5.1	72
Omaha	978	971.9	1011.1	87	66	76.2	3.6	103	25	44	4	14	0	62	64	3.20	-1.31	1.30	9	9	.0	0	12.8	SSE	39	SE	8	10	15	5	4.9	78
Scottsbluff	3950	875.7	1008.4	82	53	67.4	.9	105	23	33	3	4	0	48	56	4.13	1.35	1.84	10	11	T	T	12.0	ESE	--	---	--	7	16	7	5.4	--
Valentine CO	2581	919.4	------	79	56	67.6	.3	99	23	39	3	7	0	--	--	4.66	1.50	1.37	17	16	T	0	9.9	---	45	SE	13	6	13	11	6.1	67
NEVADA																																
Elko	5075	842.5	1011.6	76	41	58.7	-1.6	101	22	23	2	5	4	33	44	1.24	.54	.73	8	1	T	T	7.8	SW	•32	NW	°4	11	6	13	5.6	--
Ely	6257	807.3	1011.0	76	39	57.7	-1.9	99	22	25	7	4	6	27	35	.19	-.31	.12	4	1	.2	T	11.9	---	47	SE	9	11	10	9	4.6	73
Las Vegas	2162	941.8	1005.7	96	66	81.2	-2.4	115	22	51	1[illegible]	23	0	28	17	.01	-.12	.01	1	1	.0	0	13.3	SW	•54	SW	4	20	8	2	2.4	89
Reno	4397	860.5	1012.6	78	42	60.0	-1.5	100	22	25	6	7	2	34	43	.24	-.18	.10	3	1	T	T	7.6	WNW	36	NW	4	18	4	8	3.7	73
Winnemucca	4299	865.6	1011.7	78	43	60.3	-3.7	10[illegible]	22	23	6	7	5	32	38	.29	-.50	.18	4	0	T	0	9.5	---	34	NW	30	12	7	11	5.1	74

See footnotes at end of table.

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.		--	0–3	4–7	8–10	0–10	%
NEW HAMPSHIRE																																
Concord	339	1002.0	1012.9	76	53	64.4	0.3	95	22	39	18	3	0	55	74	3.82	0.20	1.23	12	6	0.0	0	5.5	SE	21	S	°22	5	9	16	7.2	42
Mt. Washington	6262	806.4	1019.3	50	40	44.9	.5	66	22	29	6	0	3	--	91	8.91	2.65	1.50	18	6	.4	T	21.9	NW	%78	NW	7	2	6	22	8.1	24
NEW JERSEY																																
Atlantic City CO	8	1011.9	1013.5	76	62	69.0	.3	91	°27	52	19	2	0	--	--	.28	-2.71	.13	7	2	.0	0	15.0	---	35	NE	16	12	13	5	4.8	78
Newark	11	1012.5	1013.7	81	61	71.1	.6	95	21	53	°19	5	0	56	62	.85	-2.95	.37	7	2	.0	0	10.7	SSW	•29	NW	27	10	12	8	5.5	--
Trenton CO	56	1006.4	1013.2	81	61	70.9	.1	91	°26	52	17	4	0	--	--	1.22	-2.65	.59	5	6	T	T	9.4	---	•32	NW	28	12	10	8	4.9	72
NEW MEXICO																																
Albuquerque	5310	846.3	1006.7	91	62	76.4	1.5	100	21	45	7	18	0	31	23	.01	-.71	.01	1	1	.0	0	11.3	SE	42	W	6	25	3	2	2.1	90
Clayton	4969	843.6	1008.7	88	56	72.0	2.4	95	°17	39	3	15	0	--	--	.46	-1.45	.46	2	6	T	T	----	---	--	---	--	20	8	2	2.4	--
Roswell	3612	890.3	1008.2	95	63	78.9	2.1	103	17	54	8	28	0	45	36	.09	-1.38	.06	2	4	.0	0	12.2	---	40	W	6	19	10	1	2.6	--
NEW YORK																																
Albany	277	1008.8	1012.8	79	57	67.7	.7	95	22	44	17	3	0	56	70	2.89	-.48	.80	14	9	T	T	7.0	SSE	35	NW	27	6	8	16	6.7	51
Binghamton	1601	955.6	1013.7	75	55	65.3	1.1	88	°22	45	°6	0	0	55	72	3.93	.28	1.53	14	8	T	T	9.8	WNW	37	N	12	4	9	17	7.0	62
Buffalo	693	986.1	1013.9	78	59	68.2	2.7	90	°15	45	7	2	0	56	67	2.57	-.13	.74	13	5	.0	0	13.7	SW	56	NNW	12	4	12	14	6.8	67
New York CO	10	1002.4	------	78	62	70.3	.5	90	25	54	6	1	0	--	--	1.52	-2.18	.87	8	2	.0	0	11.8	---	51	NW	27	11	10	9	5.1	68
New York	19	1011.9	1013.9	81	63	71.7	.7	92	°26	55	17	4	0	56	63	1.48	-1.90	.69	4	2	.0	0	11.5	NE	47	NW	27	9	11	10	5.5	--
Rochester	543	994.2	1013.2	78	58	68.1	1.5	89	°14	46	5	0	0	57	70	2.03	-.82	.78	11	7	.0	0	8.9	SW	42	W	27	3	15	12	6.6	62
Schenectady	217	------	------	79	58	68.5	.5	94	22	48	17	3	0	--	--	2.95	-.91	.90	13	6	.0	0	----	---	--	---	--	13	11	6	4.6	--
Syracuse	424	992.2	1013.8	79	58	68.4	.6	92	22	47	6	2	0	57	70	3.66	-.02	1.37	11	6	.0	0	8.4	WNW	43	N	12	4	15	11	6.8	60
NORTH CAROLINA																																
Asheville CO	2203	------	------	84	59	71.2	-.1	95	27	45	6	4	0	--	--	3.08	-.44	1.38	8	8	.0	0	6.0	---	38	SE	14	10	16	4	4.9	75
Asheville	2093	944.1	1016.4	--	--	----	----	---	--	--	--	--	--	59	74	----	----	----	--	--	---	--	2.9	NNW	--	---	--	--	--	--	---	--
Charlotte	753	988.5	1015.6	89	65	77.2	.6	103	27	50	5	21	0	60	60	.67	-2.84	.26	6	5	.0	0	5.9	SW	26	SW	3	7	17	6	5.2	86
Greensboro	891	984.8	1016.2	87	61	74.4	-.2	102	27	43	6	13	0	61	65	2.69	-.93	1.13	7	7	.0	0	7.2	SW	28	NW	9	8	17	5	5.2	79
Hatteras	4	1014.2	1015.0	82	72	77.1	1.5	89	27	68	°18	0	0	69	77	.94	-3.43	.87	3	5	.0	0	12.2	SSW	32	NE	18	10	13	7	5.3	69
Raleigh	438	999.7	1015.2	89	62	75.4	-.3	104	27	44	6	13	0	61	65	1.12	-3.10	.4[illegible]	7	7	.0	0	7.5	SW	--	---	--	10	16	4	4.4	--
Wilmington	30	1013.9	1015.3	88	68	77.8	.2	102	27	5[illegible]	6	9	0	--	--	1.36	-3.13	.5[illegible]	4	11	.0	0	9.3	---	33	NW	23	13	14	3	4.3	82
Winston-Salem	967	981.4	1016.1	88	63	75.5	.6	102	27	4[illegible]	6	13	0	60	62	2.03	-1.57	1.24	7	5	.0	0	7.4	NNW	•25	NNE	9	10	14	6	4.7	--
NORTH DAKOTA																																
Bismarck	1650	951.6	1010.7	74	52	62.6	-1.7	94	23	40	4	2	0	52	71	3.64	.31	1.23	14	10	T	T	12.7	WNW	65	E	27	7	10	13	6.3	57
Devils Lake CO	1471	957.3	------	71	52	61.4	-1.0	91	23	35	1	1	0	--	--	8.55	5.37	2.5[illegible]	15	7	.0	0	9.1	---	49	SW	7	7	10	13	6.2	58
Fargo *	895	977.0	1010.7	76	54	65.3	.7	9[illegible]	°23	3[illegible]	4	2	0	54	68	1.46	-1.58	.92	5	[illegible]	.0	0	14.3	N	91	SW	7	6	8	16	6.8	56
Williston CO	1877	943.4	1010.[illegible]	7[illegible]	50	60.0	-3.0	92	23	3[illegible]	2	1	0	47	62	2.29	-1.30	.53	15	7	.5	1	8.6	---	37	SE	5	2	9	19	7.6	60
OHIO																																
Akron	1210	977.7	1015.3	81	58	69.3	.9	93	°21	43	6	3	0	59	72	2.98	-.86	.95	10	12	T	0	8.1	SW	--	---	--	3	15	12	6.4	--
Cincinnati Obs.	761	------	------	86	64	74.7	1.9	97	26	46	5	11	0	--	--	5.93	1.88	2.18	12	12	T	0	5.0	---	29	NW	8	--	--	--	---	72
Cincinnati	869	983.7	1015.3	86	63	74.3	2.5	98	26	44	5	13	0	60	66	3.39	-.65	.71	9	10	.0	0	8.3	SSW	•37	SW	8	6	14	10	6.0	--
Cleveland CO	663	------	------	80	64	71.7	2.4	95	21	49	°6	4	0	--	--	1.00	-2.26	.49	7	--	.0	0	----	---	--	---	--	--	--	--	---	--
Cleveland	787	987.8	1014.4	83	61	72.1	2.7	97	15	45	6	9	0	59	67	1.38	-1.67	.42	8	11	.0	0	9.0	SSW	38	SW	1	4	14	12	6.5	59
Columbus CO	724	------	------	84	65	74.6	2.6	95	26	45	5	10	0	--	--	3.70	.04	1.99	10	--	.0	0	----	---	--	---	--	--	--	--	---	--
Columbus	815	985.8	1014.8	85	61	72.9	2.2	97	26	44	5	10	0	62	71	3.27	-1.06	1.68	10	7	.0	0	6.5	SSW	41	N	26	7	16	7	5.7	73
Dayton	1002	979.0	1014.6	85	63	73.6	2.7	98	26	41	5	10	0	62	69	2.14	-1.76	1.00	9	8	.0	0	7.7	SSW	34	W	16	5	15	10	5.9	71
Portsmouth CO	715	------	------	85	61	72.8	1.1	97	26	44	5	8	0	--	--	5.85	2.44	3.43	11	10	.0	0	4.1	---	%49	SW	1	--	--	--	---	--
Sandusky CO	603	992.6	------	82	65	73.4	3.5	97	°25	48	6	7	0	--	--	1.41	-2.32	.26	10	10	T	0	6.7	---	30	NW	20	9	15	6	6.7	72
Toledo	622	990.9	1013.9	83	61	72.3	3.7	94	°25	42	°6	8	0	61	70	3.65	.10	1.29	10	10	T	T	9.9	SW	47	NW	20	2	12	16	7.0	66
Youngstown	1178	973.2	1015.1	80	57	68.5	.5	92	21	45	°6	3	0	57	70	2.77	-.94	1.49	12	9	.0	0	8.7	SSW	•38	WSW	3	5	14	11	6.2	--
OKLAHOMA																																
Oklahoma City	1280	969.9	1012.4	90	66	77.9	.4	97	°22	47	4	18	0	62	63	.93	-3.00	.64	5	7	.0	0	12.[illegible]	SSE	42	SW	14	19	10	1	2.8	88
Tulsa	672	988.8	1012.7	90	69	79.6	2.1	99	29	49	4	22	0	65	64	1.65	-3.50	.84	5	4	.0	0	11.4	S	29	NW	°3	18	9	3	3.3	84
OREGON																																
Astoria	12	1016.6	1017.2	61	47	54.2	-3.4	71	29	41	18	0	0	49	84	5.48	3.16	1.56	22	0	.0	0	6.1	W	--	---	--	3	3	24	8.3	--
Burns CO	4140	871.3	1013.0	70	42	55.8	-4.7	94	22	30	2	2	4	36	52	1.38	.53	.52	10	1	1.0	T	----	---	--	---	--	7	10	13	6.3	--
Eugene	361	1003.1	1016.7	68	45	56.6	-4.7	83	29	37	°18	0	0	48	75	1.51	.14	.46	12	1	.0	0	7.3	W	•28	W	3	4	4	22	8.1	--
Meacham	4050	------	------	61	40	50.5	-3.6	82	25	31	°2	0	4	--	--	3.91	1.30	1.04	14	4	6.1	3	----	---	--	---	--	3	6	21	7.8	--
Medford	1312	968.2	1015.5	74	47	60.3	-4.6	94	°21	36	°1	2	0	45	62	1.25	.28	.37	9	1	T	0	3.6	WNW	•23	SW	3	8	3	19	6.5	--
Pendleton	1489	960.0	1013.4	74	50	61.7	-5.0	92	25	39	2	1	0	41	52	1.42	.21	.45	10	1	T	T	10.8	W	--	---	--	5	12	13	6.7	--
Portland	22	1010.2	1015.8	66	50	58.0	-4.6	82	29	42	28	0	0	50	77	3.58	1.86	.81	17	1	.0	0	5.7	NW	34	S	3	3	3	24	8.4	40
Roseburg	505	998.0	1016.6	70	45	57.6	---	85	29	34	6	0	0	--	--	1.05	-.30	.29	14	0	.0	0	4.7	---	17	SW	°3	5	4	21	7.6	38
Salem	195	1008.8	1016.3	68	46	57.0	-5.8	85	29	38	18	0	0	49	76	2.47	1.25	.81	18	0	.0	0	6.2	S	--	---	--	2	5	23	8.4	--
Sexton Summit CO	3836	------	------	61	42	51.2	-4.8	80	21	31	1	0	2	--	--	1.66	.16	.48	10	0	1.5	T	----	---	--	---	--	9	4	17	6.3	--
PENNSYLVANIA																																
Allentown	381	1000.3	1014.3	81	58	69.7	.1	93	°26	48	°18	5	0	57	66	2.47	-1.58	1.08	6	5	.0	0	9.5	W	--	---	--	9	15	6	5.2	--
Harrisburg	335	1001.0	1014.5	82	61	71.6	.5	94	°26	49	6	6	0	56	60	.58	-3.06	.30	6	5	.0	0	7.5	WNW	38	NW	27	10	11	9	5.4	73
Philadelphia CO	26	------	------	82	64	72.9	.3	91	13	56	°18	5	0	--	--	3.23	-.74	2.23	8	4	.0	0	7.9	---	25	S	1	12	13	5	4.6	73
Philadelphia	13	1009.5	1013.9	83	62	72.9	.8	93	°25	54	7	7	0	57	60	2.59	-1.28	2.29	7	4	.0	0	9.9	WNW	•34	WNW	27	10	14	6	4.9	--
Pittsburgh CO	749	------	------	82	62	72.2	.5	92	°21	51	5	6	0	--	--	4.37	.54	1.21	12	--	.0	0	----	---	--	---	--	--	--	--	---	61
Pittsburgh	1151	985.1	1015.1	80	59	69.4	.8	90	21	47	6	1	0	58	68	3.79	-.28	1.67	13	11	.0	0	9.6	WSW	•30	NNE	10	4	15	11	6.1	69
Reading CO	266	1002.0	1013.5	83	62	72.6	1.3	95	21	53	18	7	0	--	--	1.39	-2.37	.69	7	6	.0	0	10.8	---	43	NW	13	9	14	7	5.1	66
Scranton CO	746	984.8	1013.5	80	59	69.4	1.3	93	22	49	18	2	0	--	--	2.11	-1.74	1.33	8	8	T	0	6.5	---	35	NW	13	10	9	11	5.6	67
Williamsport	527	995.3	1013.7	83	58	70.5	1.3	96	°22	4[illegible]	7	5	0	56	64	1.96	-1.46	.78	8	8	T	T	7.7	WNW	•50	SSW	1	9	11	10	5.8	--
RHODE ISLAND																																
Block Island	110	1008.5	1012.6	70	57	63.6	.6	83	26	51	°18	0	0	--	--	1.19	-1.67	.31	12	3	.0	0	----	---	--	---	--	8	12	10	5.9	--
Providence	55	1007.1	1013.2	76	57	66.5	.9	89	20	4[illegible]	17	0	0	56	72	1.31	-1.86	.53	14	6	.0	0	11.0	SW	30	SW	1	9	8	13	6.1	51
SOUTH CAROLINA																																
Charleston CO	9	------	------	87	73	80.2	.6	102	27	60	5	9	0	--	--	.47	-3.82	.23	5	10	.0	0	9.7	---	34	NE	19	14	12	4	3.8	87
Charleston	41	1013.2	1015.2	90	68	79.1	1.2	101	27	56	5	16	0	68	74	.96	-3.76	.84	4	8	T	0	8.9	SE	--	---	--	9	15	6	4.8	--
Columbia	217	1006.4	1014.4	94	66	79.9	.4	107	27	53	5	23	0	64	63	1.49	-2.56	.72	7	8	.0	0	5.8	NE	--	---	--	17	11	2	3.4	86
Florence	146	1009.5	1014.9	94	67	80.1	1.1	108	27	54	6	23	0	--	--	.24	-4.64	.11	4	4	.0	0	----	---	--	---	--	10	18	2	4.2	--
Greenville	1018	978.0	1015.3	89	66	77.3	.7	101	27	52	5	19	0	59	59	2.02	-.98	1.15	7	10	.0	0	8.5	NE	43	W	1	8	17	5	5.0	78
Spartanburg	801	------	------	89	66	77.7	.5	104	27	52	5	17	0	--	--	1.14	-1.86	.65	6	8	.0	0	----	---	--	---	--	11	15	4	4.4	--
SOUTH DAKOTA																																
Huron	1282	963.8	1009.9	79	57	67.7	-.5	94	24	39	4	4	0	57	73	2.49	-.57	.95	13	8	T	T	11.3	SSE	56	W	7	6	10	14	6.5	63
Rapid City	3165	897.7	1010.4	76	52	63.7	.0	98	23	34	2	3	0	50	64	3.18	-.18	1.10	12	10	T	0	11.5	NNW	36	NW	°2	8	9	13	6.2	53
Sioux Falls	1420	959.7	1010.[illegible]	80	58	69.4	1.4	99	24	38	4	4	0	57	68	4.12	-.13	1.11	11	12	T	0	11.8	S	•55	WNW	18	5	12	13	6.3	--
TENNESSEE																																
Bristol	1519	962.8	------	85	60	72.4	.1	97	27	43	6	6	0	--	--	4.98	1.31	3.10	7	12	T	T	----	---	--	---	--	11	14	5	4.7	--
Chattanooga	670	988.8	1015.8	90	64	76.9	1.1	102	27	43	5	19	0	64	70	2.03	-2.18	.88	8	11	.0	0	2.7	S	35	W	1	14	11	5	4.1	77
Knoxville	950	981.4	1016.3	88	65	76.5	.7	100	27	52	6	16	0	61	63	2.32	-1.15	1.15	6	7	.0	0	5.7	SW	31	SW	3	11	15	4	4.5	68
Memphis CO	271	------	------	90	73	81.5	2.8	101	27	56	4	21	0	--	--	2.83	-.42	1.40	7	--	T	T	----	---	--	---	--	--	--	--	---	--
Memphis	263	1000.3	1014.6	93	70	81.2	2.9	104	28	52	5	23	0	66	63	2.41	-.92	1.09	6	10	.0	0	----	---	40	S	2	16	12	2	4.0	89

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature										Average dew point	Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below			Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F	°F.	°F.	°F.	°F		°F.		#		°F.	%	In.	In.	In.			In.	In.	M p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
TENNESSEE (Cont.)																																
Nashville	577	995.9	1015.6	90	66	78.1	1.2	101	27	47	5	23	0	65	67	2.42	-0.77	0.79	8	12	.0	0	5.2	S	36	NW	9	16	13	1	3.7	74
Oak Ridge CO	905	983.4	------	88	62	75.1	-.7	101	27	48	6	14	0	--	--	2.29	-1.62	1.83	4	6	T	T	3.9	---	22	SW	1	11	13	6	4.4	--
TEXAS																																
Abilene	1759	951.2	1010.6	93	70	81.8	2.0	99	°16	52	4	24	0	61	53	.03	-2.76	.03	1	4	.0	0	14.5	SSE	47	SE	26	15	10	5	4.1	90
Amarillo	3590	887.2	1009.2	91	62	76.6	3.0	98	°16	45	3	20	0	53	52	1.95	-1.30	.94	4	6	T	T	15.7	S	56	SW	10	19	10	1	2.8	89
Austin	615	991.9	1013.3	95	72	83.5	2.0	99	30	61	4	26	0	67	64	.68	-2.52	.31	3	1	.0	0	11.3	S	29	NE	3	10	15	5	4.8	80
Brownsville	16	1010.2	1012.3	90	75	82.6	.0	93	°1	70	°24	23	0	73	77	2.89	-.47	1.95	6	2	.0	0	15.3	SE	52	E	25	4	21	5	5.4	70
Corpus Christi	40	1012.2	1013.3	91	75	82.7	1.7	93	°3	67	30	21	0	73	77	2.42	-.46	1.16	6	2	.0	0	14.0	SE	40	SE	26	3	19	8	6.0	78
Dallas	487	995.3	1013.5	95	73	83.8	1.9	100	23	53	4	26	0	64	55	2.00	-1.45	1.80	2	2	.0	0	11.3	SSE	65	N	15	19	10	1	3.0	89
Del Rio	1091	977.3	1010.8	93	73	83.0	.3	101	2	66	15	24	0	67	64	4.34	1.92	2.06	6	6	.0	0	11.2	ESE	32	SE	26	4	15	11	6.2	52
El Paso	3920	883.2	1007.4	94	68	81.3	1.1	103	21	62	°8	26	0	39	26	.23	-.39	.12	2	2	.0	0	11.3	S	40	SE	21	18	8	4	3.0	96
Fort Worth	544	992.9	1013.2	95	73	83.9	2.5	100	°24	54	4	27	0	63	54	1.20	-2.19	1.15	2	2	.0	0	15.2	S	*32	NE	15	19	10	1	3.0	--
Galveston CO	7	------	------	86	77	81.5	.0	95	30	68	4	1	0	--	--	1.60	-1.75	1.20	3	--	.0	0	11.8	---	27	S	2	--	--	--	---	81
Galveston	5	1012.9	1015.0	87	77	82.2	.4	95	30	68	4	5	0	73	76	.55	-2.80	.51	3	5	.0	0	11.8	S	--	---	--	10	14	6	4.8	--
Houston CO	41	1009.5	------	91	74	82.7	.9	97	30	63	4	23	0	--	--	.53	-3.55	.35	4	8	.0	0	9.8	---	30	SE	6	8	16	6	5.0	82
Houston	50	1011.5	1014.0	91	72	81.3	.8	97	30	63	5	23	0	70	72	1.24	-2.45	.91	5	7	.0	0	12.6	SSE	--	---	--	4	18	8	5.7	--
Laredo	500	995.9	1010.8	97	76	86.3	.5	103	16	70	°25	28	0	69	62	2.18	.09	2.12	4	3	.0	0	18.1	SE	*44	ESE	24	7	14	9	5.7	--
Lubbock	3243	900.8	1009.3	91	64	77.5	1.1	99	17	51	4	20	0	54	51	.51	-2.02	.29	4	1	.0	0	15.9	S	*35	S	°5	17	11	2	3.3	--
Midland	2854	913.3	1009.9	91	68	79.7	-.4	99	16	59	4	22	0	59	54	1.97	.01	1.25	5	5	.0	0	9.5	SE	*35	E	29	17	10	3	3.7	--
Port Arthur	16	1013.5	1014.8	90	72	81.3	1.2	100	30	61	4	22	0	72	76	1.97	-2.81	1.09	5	9	.0	0	9.4	S	32	S	2	10	18	2	4.4	87
San Angelo	1903	945.5	1011.0	91	70	80.5	-.1	97	16	58	4	24	0	62	57	.50	-1.32	.29	6	4	.0	0	----	---	--	---	--	14	11	5	4.5	--
San Antonio	792	988.2	1012.7	94	73	83.5	1.5	99	2	63	5	27	0	66	63	2.71	-.49	1.76	5	3	T	T	11.6	SSE	56	SE	18	4	19	7	5.3	75
Victoria	110	1008.8	1013.2	93	73	82.8	-.3	96	30	64	5	28	0	70	67	1.40	-1.84	.75	4	3	.0	0	11.1	---	%41	SSE	6	7	17	6	5.3	--
Waco	500	994.6	1012.8	94	72	83.1	1.3	99	30	57	4	27	0	67	61	.79	-2.40	.56	3	3	.0	0	11.7	S	--	---	--	14	13	3	4.1	--
Wichita Falls	1027	975.6	1011.4	93	70	81.4	1.8	98	°22	53	4	24	0	63	56	3.56	.16	1.67	4	6	.0	0	9.[illegible]	SE	*60	NW	°1	23	7	0	2.1	--
UTAH																																
Milford	5028	843.9	1010.6	83	47	64.8	-1.[illegible]	104	23	32	°3	9	2	--	--	.35	-.10	.32	2	4	.0	0	----	---	--	---	--	15	6	9	4.3	--
Salt Lake City	4222	864.5	1010.3	79	52	65.3	-1.8	100	23	35	2	5	0	41	45	1.83	.92	.88	7	4	T	0	10.[illegible]	SE	37	N	27	9	9	12	5.4	72
VERMONT																																
Burlington	331	998.0	1012.4	75	5[illegible]	65.4	-.1	91	22	46	12	1	0	58	78	3.89	.32	1.02	15	7	.0	0	8.1	N	32	NW	22	6	5	19	7.4	48
VIRGINIA																																
Lynchburg	947	982.4	1015.6	85	61	73.0	.2	96	°26	45	6	8	0	59	65	2.72	-1.16	2.03	9	9	T	T	7.[illegible]	SSW	43	NW	10	8	11	11	5.7	79
Norfolk	26	1013.9	1015.1	85	6[illegible]	75.6	.[illegible]	97	27	55	20	9	0	62	66	.37	-3.79	.36	3	3	.0	0	8.1	SW	29	SW	3	8	17	5	5.5	76
Richmond	162	1009.1	1015.1	87	6[illegible]	74.6	.3	98	°26	50	6	11	0	60	6[illegible]	1.09	-2.78	.52	6	[illegible]	.0	0	7.[illegible]	SW	31	NW	26	7	17	6	5.4	73
Roanoke	1174	974.3	1015.8	87	6[illegible]	73.5	.[illegible]	98	13	44	6	11	0	58	62	2.82	-.88	1.15	10	6	.0	0	7.[illegible]	WSW	--	---	--	7	1[illegible]	6	5.2	--
WASHINGTON																																
Olympia	190	1008.5	1015.8	66	4[illegible]	55.2	-3.[illegible]	83	2[illegible]	38	°4	0	0	46	7[illegible]	3.36	2.08	1.20	1[illegible]	0	.0	0	7.4	SSW	*22	SW	6	[illegible]	4	23	8.1	--
Seattle CO	14	------	------	65	51	58.1	-3.7	75	29	46	1	0	0	--	--	1.49	.24	.40	9	0	.0	0	9.2	---	35	S	15	3	5	22	8.1	42
Seattle-Tacoma	379	1002.0	1016.2	65	48	56.3	-3.6	77	29	42	°1	0	0	47	75	2.44	1.44	1.53	13	2	.0	0	10.9	SW	--	---	--	2	6	22	8.2	--
Spokane	2357	944.1	1012.7	69	45	57.2	-4.2	84	25	35	5	0	0	40	56	.75	-.42	.40	8	2	T	0	9.3	SW	34	SW	3	3	11	16	7.0	57
Stampede Pass CO	3958	878.1	1016.9	51	37	43.6	-6.8	68	25	30	°1	0	8	--	--	6.81	2.84	1.32	20	0	9.4	58	----	---	--	---	--	3	4	23	8.4	--
Tatoosh CO	101	1012.5	1016.1	57	49	52.9	-1.1	63	°2	45	2	0	0	48	84	4.15	1.57	2.13	19	0	T	0	11.5	W	40	SW	°3	1	5	24	8.6	29
Walla Walla CO	949	977.7	1013.2	74	52	63.2	-4.7	94	25	45	°1	1	0	--	--	1.34	.13	.30	10	4	.0	0	6.4	---	34	W	3	6	11	13	6.2	54
Yakima	1061	974.3	1013.1	74	46	59.7	-5.7	88	25	33	18	0	0	40	51	.39	-.20	.15	8	0	.0	0	9.4	NW	--	---	--	5	8	17	6.7	--
WEST VIRGINIA																																
Charleston	950	980.7	1015.6	85	60	72.4	.4	94	26	50	7	7	0	61	69	3.87	-.06	1.81	8	10	.0	0	6.8	WSW	*40	WNW	16	4	16	10	6.2	--
Elkins	1970	948.2	1016.3	79	53	66.0	-.5	88	°26	45	°28	0	0	58	--	3.85	-1.41	1.18	15	10	T	T	4.2	NW	32	N	26	2	16	12	6.8	64
Huntington CO	565	------	------	88	63	75.2	1.1	98	26	48	5	14	0	--	--	1.22	-3.12	.45	10	--	.0	0	----	---	--	---	--	--	--	--	---	--
Parkersburg CO	615	------	------	85	62	73.5	1.1	96	26	49	5	10	0	--	--	5.34	1.16	1.49	13	11	.0	0	5.4	---	26	W	26	12	11	7	4.6	74
Parkersburg	837	------	------	--	--	----	---	---	--	--	--	--	--	62	--	----	----	----	--	--	---	--	6.5	SSW	--	---	--	--	--	--	---	--
WISCONSIN																																
Green Bay	689	990.5	1013.1	77	56	66.5	1.8	90	15	38	5	1	0	58	75	4.38	.81	1.56	11	11	.0	0	8.1	SW	33	SW	16	7	10	13	6.2	61
La Crosse	652	987.5	1011.6	81	62	71.8	3.2	94	25	43	4	4	0	60	65	4.76	.89	2.08	12	9	.0	0	9.3	S	*60	NNW	29	7	9	14	6.3	--
Madison	857	978.3	1012.8	83	59	71.0	3.6	96	25	43	°2	9	0	60	70	7.36	3.34	3.46	10	9	T	T	9.9	S	37	W	22	7	9	14	6.3	69
Milwaukee	675	988.8	1013.5	79	59	69.0	4.1	95	25	43	5	4	0	59	73	8.28	5.06	2.78	16	14	T	T	10.0	S	37	W	15	7	10	13	6.2	70
WYOMING																																
Casper	5322	834.4	1007.4	79	48	63.1	1.1	101	23	35	2	5	0	35	41	.62	-.86	.33	6	6	T	0	13.8	SW	--	---	--	5	12	13	6.3	--
Cheyenne	6139	810.4	1009.7	77	48	62.2	1.9	100	23	28	3	2	1	39	49	1.37	-.73	.71	5	8	T	0	11.3	SSE	42	W	7	8	15	7	5.3	69
Lander	5563	832.7	1009.6	77	47	61.7	.2	100	23	35	°3	3	0	34	38	.09	-1.26	.09	1	5	.0	0	8.4	---	40	W	27	6	14	10	5.9	73
Sheridan	3942	880.8	1010.5	75	45	60.1	-1.3	99	23	34	2	3	0	44	60	1.33	-1.27	.56	9	7	T	T	9.2	NW	50	S	26	6	11	13	6.2	62
PACIFIC AREA																																
Canton Island	9	1009.8	1010.0	90	78	83.6	-.7	94	14	71	5	11	0	73	74	.82	-1.98	.46	3	0	.0	0	----	---	--	---	--	16	13	1	3.9	--
Hilo	31	1015.9	1017.3	82	67	74.8	.4	85	°7	65	°2	0	0	68	81	6.33	-.42	.55	27	0	.0	0	6.[illegible]	WSW	*23	ESE	°11	0	15	15	7.4	53
Honolulu	7	1016.9	1017.6	84	73	78.3	.4	85	°11	71	°3	0	0	66	68	.20	-.03	.15	6	0	.0	0	12.[illegible]	ENE	39	E	26	3	16	11	6.4	67
Koror CO	94	1006.1	1009.8	88	75	81.6	.4	90	°2	74	°9	8	0	76	87	15.57	3.12	2.10	27	8	.0	0	2.[illegible]	---	18	SW	11	0	8	22	8.5	--
Lihue	115	1012.9	1018.1	82	72	76.9	.[illegible]	83	°17	70	°1	0	0	69	79	1.33	-.32	.20	24	0	.0	0	13.1	NE	30	NE	1	0	16	14	7.5	41
Truk (Moen Island)	8	1009.8	1010.2	86	77	81.8	1.3	88	°24	75	17	0	0	76	85	14.38	1.16	2.45	25	9	.0	0	----	---	--	---	--	1	8	21	8.4	--
Ponape CO	112	1005.1	1010.3	87	73	80.1	-.9	91	5	69	19	3	0	75	86	18.43	2.06	4.15	29	1	.0	0	----	---	--	---	--	1	11	18	7.9	--
Wake Island	11	1014.6	1015.2	85	76	80.5	-.8	86	°12	71	2	0	0	74	79	1.19	-.61	.35	10	0	.0	0	14.7	E	--	---	--	10	15	5	4.9	--
Yap CO	53	1007.8	1009.9	88	76	82.0	-.1	92	23	73	6	4	0	77	85	9.91	-.48	2.65	21	2	.0	0	----	---	--	---	--	0	8	22	8.6	--
WEST INDIES																																
San Juan CO	47	------	------	84	74	79.0	-.5	90	17	71	7	1	0	--	--	7.01	1.85	2.81	19	10	.0	0	----	---	--	---	--	--	--	--	---	--
San Juan P.R.	9	1013.9	1015.8	86	74	80.3	.[illegible]	91	18	71	6	2	0	73	7[illegible]	6.57	.79	3.12	20	9	.0	0	10.6	E	2[illegible]	SE	6	5	10	15	6.7	71
ALASKA																																
Anchorage	92	1004.4	1009.6	64	46	54.7	1.0	76	18	38	3	3	0	42	63	.91	.02	.29	6	0	.0	0	6.3	S	*25	SE	18	3	7	20	7.6	59
Annette	110	1008.8	1012.8	56	46	51.3	-3.0	72	3	41	1	1	0	47	86	6.39	1.70	1.58	22	1	.0	0	13.1	SSE	*33	SE	14	0	3	27	9.3	--
Barrow	22	1013.2	1013.9	39	29	34.0	.1	62	30	25	°5	0	26	32	92	.85	.57	.33	8	0	4.1	4	12.2	---	30	E	4	4	6	20	7.8	--
Bethel	21	1007.5	1009.0	64	44	53.9	1.3	79	19	36	13	3	0	46	75	.69	-.51	.27	6	2	.0	0	9.3	NW	*23	NW	22	3	6	21	7.5	--
Cordova	40	1008.8	1010.7	59	42	50.3	1.0	70	4	33	15	1	0	45	78	1.67	-2.52	.47	14	0	.0	0	5.4	SW	*20	SE	9	3	1	26	8.7	--
Fairbanks	436	990.5	1007.4	70	47	58.6	-.7	83	4	37	17	15	0	44	60	1.78	.41	.48	8	1	.0	0	5.7	N	29	E	29	2	12	16	7.4	--
Juneau	15	1009.8	1010.7	62	45	53.8	.2	80	4	38	17	8	0	44	73	1.48	-1.70	.48	13	0	.0	0	7.7	E	31	SE	3	4	3	23	8.1	35
Kotzebue	10	1008.8	1009.3	50	37	43.5	.2	73	8	29	°2	1	6	38	84	.29	-.20	.17	5	0	.0	T	15.[illegible]	W	*34	WNW	°13	11	5	14	5.9	--
McGrath	334	995.3	1007.9	67	45	56.2	.5	79	7	36	25	12	0	45	6[illegible]	1.83	-.23	.62	9	1	.0	0	5.[illegible]	N	*18	S	2	1	10	19	7.7	--
Nome	13	1008.5	1009.2	54	41	47.5	1.7	72	[illegible]	33	16	1	0	38	7[illegible]	.94	-.14	.40	9	0	.0	0	9.[illegible]	WSW	31	N	11	8	11	11	5.8	55
Northway	1713	945.5	1008.1	67	43	54.9	-.8	78	4	37	°3	11	0	43	68	1.71	-.29	.58	14	7	T	T	6.[illegible]	NW	*23	WNW	22	4	7	19	7.3	--
St. Paul Island	22	1009.8	1011.0	44	35	39.7	-1.8	52	1[illegible]	32	°1	0	3	37	91	.18	-1.13	.13	6	0	.0	0	----	---	--	---	--	0	5	25	9.1	--
Yakutat	28	1009.8	1011.1	57	43	50.3	.8	71	3	37	14	2	0	46	84	1.41	-3.55	.33	14	[illegible]	.0	0	8.1	W	*25	SSE	°5	1	5	24	8.[illegible]	--

Data from airport unless otherwise specified. CO indicates data from city office.

* Data entered in column "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.

° Other dates also.

% Peak gust.

# Max. 70°F. or above for Alaskan Stations.

& Maximum hourly average.

HEATING DEGREE DAYS

Table 3

(Base 65°F.)

JUNE 1954

State and station	Current season: This month	Current season: Period July through this month	Normals July through this month
ALABAMA			
Birmingham	3	2641	2780
Mobile	0	1552	1612
Montgomery (CO)	0	1898	1954
Montgomery	0	2061	2137
ARIZONA			
Flagstaff	217	6977	7525
Phoenix (CO)	0	1113	1492
Phoenix	0	1365	1698
Prescott	33	4014	4533
Tucson	0	1350	1776
Winslow	15	4337	4702
Yuma	0	743	951
ARKANSAS			
Ft. Smith	2	3183	3188
Little Rock	0	2800	2982
Texarkana	0	2355	2362
CALIFORNIA			
Bakersfield	8	2104	2115
Bishop	53	3920	4222
Blue Canyon	317	5285	5719
Burbank	15	1422	1308
Eureka (CO)	306	4556	4632
Fresno	21	2523	2532
Los Angeles (CO)	9	1111	1451
Los Angeles	19	1535	2015
Mt. Shasta (CO)	267	5476	5913
Oakland	124	2828	3163
Red Bluff	21	2441	2546
Sacramento (CO)	22	2409	2600
Sacramento	29	2649	2822
Sandberg (CO)	168	4055	4243
San Diego	20	1180	1574
San Francisco (CO)	200	2953	3069
San Francisco	184	3196	3421
San Jose	77	2260	2410
Santa Maria	183	2785	2934
COLORADO			
Alamosa	150	7955	8659
Colorado Springs	49	5575	6254
Denver	42	5074	6132
Grand Junction	40	4970	5796
Pueblo	9	4699	5709
CONNECTICUT			
Bridgeport	19	5064	5896
Hartford	21	5470	6139
New Haven	31	5458	6026
DELAWARE			
Wilmington	7	4573	4910
DISTRICT OF COLUMBIA			
Washington (CO)	1	3778	4258
Washington	1	3867	4333
FLORIDA			
Apalachicola (CO)	0	1164	1307
Daytona Beach	0	730	868
Fort Myers	0	360	405
Jacksonville (CO)	0	989	1113
Jacksonville	0	1117	1243
Key West (CO)	0	39	77
Miami (CO)	0	163	173
Int. Airport, Hialeah	0	144	178
Miami Beach	0	80	123
Orlando	0	612	650
Pensacola (CO)	0	1350	1435
Tallahassee	0	1380	1519
Tampa	0	530	674
West Palm Beach	0	220	248
GEORGIA			
Albany	0	1620	1763
Atlanta	7	2697	2826
Athens	2	2710	2800
Augusta	0	2356	2138
Columbus	1	2238	2396
Macon	0	2032	2049
Rome	8	3200	3138
Savannah	0	1716	1710
Valdosta	0	1418	1525
IDAHO			
Boise	172	5304	5890
Lewiston	151	5109	5483
Pocatello	204	6178	6976
ILLINOIS			
Cairo (CO)	2	3496	3756
Chicago (CO)	44	5315	
Chicago	34	5399	6310
Chicago University	45	5419	
Moline	39	5813	6364
Peoria	31	5409	6087
Springfield	26	5007	5693
INDIANA			
Evansville	15	4240	4360
Ft. Wayne	43	5586	6287
Indianapolis (CO)	20	4693	5134
Indianapolis	24	5036	5611
South Bend	53	5936	6524
Terre Haute	21	4916	5366
IOWA			
Burlington	35	5526	6101
Des Moines	39	5881	6446
Dubuque	51	6613	7271
Keokuk (CO)	24		
Sioux City	39	6314	7012
KANSAS			
Concordia (CO)	26	4770	5323
Dodge City	16	4567	5058
Goodland	41	5661	6367
Topeka (CO)	11	4376	4919
Topeka	12	4550	5209
Wichita	13	4169	4571
KENTUCKY			
Lexington	17	4274	4979
Louisville (CO)	11	3845	4279
Louisville	12	4111	4439
Pikeville (CO)	9	3668	
LOUISIANA			
Baton Rouge	0	1492	1595
Lake Charles	0	1357	1543
New Orleans (CO)	0	1087	1175
New Orleans	0	1162	
Int.Airport, Moisant	0	1312	1317
Shreveport	0	2056	2117
MAINE			
Caribou	186	9262	10173
Greenville (CO)	170	8627	
Portland	146	7161	7631
MARYLAND			
Baltimore (CO)	0	3636	4203
Baltimore	5	4427	4611
Frederick	9	4940	4854
MASSACHUSETTS			
Blue Hill Obs.	112	6054	
Boston	61	5267	5791
Nantucket	129	5500	6102
Pittsfield	97	7095	7694
MICHIGAN			
Alpena (CO)	109	7437	8073
Detroit	46	5801	6404
Detroit (Willow Run)	47	5899	
Escanaba (CO)	123	7823	8657
Grand Rapids (CO)	53	5894	6474
Grand Rapids	62	6308	7075
Lansing	62	6462	6982
Marquette (CO)	157	7888	8529
Muskegon	67	6346	7089
Sault Ste. Marie	169	8779	9475
MINNESOTA			
Duluth (CO)	180	9249	9574
Duluth	138	9393	9937
International Falls	132	10239	10600
Minneapolis	39	7237	7853
Rochester	57	7417	8095
St. Cloud	62	8422	8893
MISSISSIPPI			
Jackson	0	2151	2202
Meridian	0	2303	2333
Vicksburg (CO)	0	1957	2000
MISSOURI			
Columbia	22	4458	5113
Kansas City	10	4270	4888
St. Joseph	12	4881	5336
St. Louis (CO)	9	3929	4469
St. Louis	12	4175	4699
Springfield	14	4144	4693
MONTANA			
Billings	168	6568	7106
Glasgow (CO)	145	8051	8690
Great Falls	259	7181	7555
Havre (CO)	190	7744	8213
Helena	287	7456	8250
Kalispell	304	7746	8055
Miles City	140	7157	7822
Missoula	276	7165	7873
NEBRASKA			
Grand Island	37	5820	6311
Lincoln (CO)	26	5360	5865
Norfolk	42	6401	7065
North Platte	45	6153	6546
Omaha	24	5436	6160
Scottsbluff	69	5956	6841
Valentine (CO)	67	6275	7075
NEVADA			
Elko	238	6914	7335
Ely	248	7048	7443
Las Vegas	0	2361	2425
Reno	193	5557	6036
Winnemucca	207	5972	6369
NEW HAMPSHIRE			
Concord	85	6649	7612
Mt. Washington	599	13353	
NEW JERSEY			
Atlantic City (CO)	12	4251	4741
Newark	7	4640	5252
Trenton (CO)	14	4538	5068
NEW MEXICO			
Albuquerque	2	3787	4389
Clayton	17	4643	5138
Roswell	0	3176	3424
NEW YORK			
Albany	35	6375	6962
Binghamton	75	6813	7537
Buffalo	56	6116	6838
New York (CO)	9	4431	5050
La Guardia Fld.	5	4267	4989
Rochester	48	6277	6863
Schenectady	23	6101	
Syracuse	33	6151	6520
NORTH CAROLINA			
Asheville (CO)	19	3937	4072
Asheville	17	4395	
Charlotte	1	3016	3205
Greensboro	6	3634	3810
Hatteras (CO)	0	2138	2392
Raleigh	2	3220	3369
Wilmington	0	2226	2323
Winston-Salem	2	3379	3721
NORTH DAKOTA			
Bismarck	131	8179	9033
Devils Lake (CO)	144	9211	9940
Fargo	75	8663	9274
Grand Forks	105	9158	
Pembina	108	9238	
Williston (CO)	173	8354	9068
OHIO			
Akron	44	5866	6203
Cincinnati (CO)	14	4044	4532
Cincinnati	23	4647	5195
Cleveland (CO)	35	5112	5717
Cleveland	36	5354	6006
Columbus	23	5041	5615
Dayton	32	5075	5597
Sandusky (CO)	28	5179	5859
Toledo	39	5720	6394
Youngstown	50	5937	6172
OKLAHOMA			
Oklahoma City	4	3337	3644
Tulsa	4	3221	3584
OREGON			
Astoria	315	5052	
Burns (CO)	298	6391	6918
Eugene	243	4727	4779
Meacham	428	7329	7888
Medford	170	4406	4547
Pendleton	144	4987	5204
Portland (CO)	176	4055	4143
Portland	205	4610	4632
Roseburg	222	4361	
Salem	232	4774	4574
Sexton Summit (CO)	411	6093	6217
PENNSYLVANIA			
Allentown	17	5387	5880
Harrisburg	10	4820	5258
Philadelphia (CO)	4	4045	4523
Philadelphia	4	4358	4866
Pittsburgh (CO)	16	4563	5048
Pittsburgh	38	5340	5905
Reading (CO)	6	4524	5060
Scranton (CO)	17	5510	6047
Williamsport	11	5533	5898
RHODE ISLAND			
Block Island	67	5162	5843
Providence	50	5526	6125
SOUTH CAROLINA			
Charleston (CO)	0	1591	1769
Charleston	0	1916	1973
Columbia	0	2395	2435
Florence	0	2234	2507
Greenville	1	2853	3060
Spartanburg	1	2916	3044
SOUTH DAKOTA			
Huron	58	7422	7902
Pierre	75	6847	
Rapid City	108	6386	7535
Sioux Falls	51	7316	7848
TENNESSEE			
Bristol	18	4054	4148
Chattanooga	5	3208	3384
Knoxville	7	3446	3590
Memphis	0	2915	3137
Nashville	10	3446	3513
TEXAS			
Abilene	0	2344	2657
Amarillo	5	3721	4345
Austin	0	1602	1713
Brownsville	0	491	517
Corpus Christi	0	765	1011
TEXAS (Cont'd.)			
Dallas	0	2166	2272
Del Rio	0	1394	1407
El Paso	0	2434	2641
Ft. Worth	0	2252	2361
Galveston (CO)	0	1024	1211
Galveston	0	1070	1233
Houston (CO)	0	1119	1276
Houston	0	1242	1388
Laredo	0	789	781
Lubbock	0	3324	3587
Midland	0	2356	
Port Arthur	0	1389	1517
San Angelo	0	2123	2107
San Antonio	0	1380	1579
Victoria	0	1053	1126
Waco	0	1957	2025
Wichita Falls	0	2617	3025
UTAH			
Milford	101	5919	6445
Salt Lake City (CO)	83	4743	5463
Salt Lake City	100	5170	5866
VERMONT			
Burlington	63	7228	7365
VIRGINIA			
Lynchburg	10	3926	4153
Norfolk	0	3108	3454
Richmond	1	3632	3955
Roanoke	12	3928	4152
WASHINGTON			
Ellensburg	230	6573	6542
Olympia	28	5362	5501
Seattle (CO)	200	4410	4438
Seattle	253	5363	5275
Spokane	237	6443	6852
Stampede Pass (CO)	636	9432	9149
Tatoosh Island (CO)	356	5628	5724
Walla Walla (CO)	114	4461	4848
Yakima	171	5809	5845
WEST VIRGINIA			
Charleston	13	4147	4417
Elkins	53	5695	5773
Huntington (CO)	12	3973	4073
Parkersburg (CO)	14	4399	4750
Petersburg (CO)	9	4615	4966
WISCONSIN			
Green Bay	78	7410	8259
La Crosse	53	6719	7650
Madison (CO)	55	6528	7300
Madison	58	6564	7417
Milwaukee	69	6433	7205
WYOMING			
Casper	124	6751	7638
Cheyenne	143	6587	7562
Lander	166	6884	8303
Sheridan	190	6966	7903
ALASKA			
Anchorage	301	11047	10789
Annette	409	7270	7096
Barrow	925	20721	19994
Bethel	327	13284	12880
Cordova	432	9799	9615
Fairbanks	193	14490	14158
Juneau	330	9068	8838
Kotzebue	638	15933	16151
McGrath	256	14578	14390
Nome	521	14173	14086
Northway	297	16335	15506
St. Paul	753	11539	10839
Yakutat	434	9538	9354

Data from airport unless otherwise specified.
CO indicates data from city office.

MONTHLY AND SEASONAL HEATING DEGREE DAYS

1953 — 1954

Table 3A

State and Station	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total for Season	Normals July-June
ALABAMA														
Birmingham	0	0	1	91	394	662	576	381	383	55	95	3	2641	2780
Mobile	0	0	0	42	213	444	359	213	250	18	13	0	1552	1612
Montgomery (CO)	0	0	0	50	272	513	437	271	292	30	33	0	1898	1954
Montgomery	0	0	0	60	319	549	465	296	307	29	36	0	2061	2137
ARIZONA														
Flagstaff	22	84	212	615	803	1131	1124	846	1008	552	363	217	6977	7525
Phoenix (CO)	0	0	0	11	124	403	326	84	160	3	2	0	1113	1492
Phoenix	0	0	0	19	148	479	388	114	206	7	4	0	1365	1698
Prescott	0	1	5	270	503	874	814	536	679	231	68	33	4014	4533
Tucson	0	0	0	30	152	499	352	127	179	5	6	0	1350	1776
Winslow	0	0	3	269	590	1086	897	610	645	174	48	15	4337	4702
Yuma	0	0	0	1	74	283	258	40	87	0	0	0	743	951
ARKANSAS														
Ft. Smith	0	0	4	113	462	758	794	419	476	54	101	2	3183	3188
Little Rock	0	0	0	86	415	701	712	377	395	51	63	0	2800	2982
Texarkana	0	0	0	74	370	635	556	284	337	32	67	0	2355	2362
CALIFORNIA														
Bakersfield	0	0	0	70	269	542	504	353	296	54	8	8	2104	2115
Beaumont (CO)	0													2840
Bishop	0	4	11	300	546	782	833	515	651	191	34	53	3920	4222
Blue Canyon	4	117	63	391	638	696	924	508	893	457	277	317	5285	5719
Burbank	0	0	4	53	133	237	381	128	298	127	46	15	1422	1808
Eureka (CO)	300	185	195	319	335	514	551	460	545	435	411	306	4556	4632
Fresno	0	0	0	107	312	587	560	422	401	98	15	21	2523	2532
Los Angeles (CO)	0	0	2	16	97	188	292	98	242	120	47	9	1111	1451
Los Angeles	1	0	29	62	125	257	349	144	279	170	100	19	1535	2015
Mt. Shasta (CO)	6	88	71	424	646	815	966	664	799	459	271	267	5476	5913
Oakland	56	70	32	172	278	427	507	367	422	193	180	124	2828	3163
Red Bluff	0	5	0	83	331	473	594	368	424	129	13	21	2441	2546
Sacramento (CO)	0	5	0	86	302	487	529	421	404	126	27	22	2409	2600
Sacramento	0	4	0	118	332	540	571	449	433	140	33	29	2649	2822
Sandberg (CO)	0	40	34	274	471	698	762	428	717	317	146	168	4055	4243
San Diego	0	0	3	15	86	223	302	124	234	116	57	20	1180	1574
San Francisco (CO)	233	160	88	123	242	301	412	302	396	232	264	200	2953	3069
San Francisco	144	87	50	200	284	426	474	383	469	244	251	184	3196	3421
San Jose	4	15	12	104	233	388	459	325	407	139	97	77	2260	2410
Santa Maria	79	105	78	172	235	367	469	224	406	249	218	183	2785	2934
COLORADO														
Alamosa	24	98	294	651	1032	1533	1339	904	1023	539	368	150	7955	8659
Colorado Springs	4	24	71	406	707	1074	908	663	951	383	335	49	5575	6254
Denver	0	0	47	329	649	1033	884	589	912	333	256	42	5074	6132
Grand Junction	0	0	2	316	667	1166	994	674	766	248	97	40	4970	5796
Pueblo	0	1	29	300	638	1008	872	584	818	246	194	9	4699	5709
CONNECTICUT														
Bridgeport	0	1	53	240	565	803	1151	775	771	436	250	19	5064	5896
Hartford	0	10	99	309	616	862	1251	803	802	446	251	21	5470	6139
New Haven	4	9	80	303	610	842	1191	785	821	484	298	31	5458	6026
DELAWARE														
Wilmington	0	0	53	215	589	810	1040	684	723	289	163	7	4573	4910
DISTRICT OF COLUMBIA														
Washington (CO)	0	0	28	128	488	717	889	583	621	191	132	1	3778	4258
Washington	0	0	30	142	499	739	893	595	627	198	143	1	3867	4333
FLORIDA														
Apalachicola (CO)	0	0	0	26	153	287	312	176	204	5	1	0	1164	1307
Daytona Beach	0	0	0	19	72	163	159	126	188	3	0	0	730	868
Fort Myers	0	0	0	6	32	91	72	60	99	0	0	0	360	405
Jacksonville (CO)	0	0	0	23	162	247	235	133	180	8	1	0	989	1113
Jacksonville	0	0	0	26	172	272	266	161	207	13	0	0	1117	1243
Key West (CO)	0	0	0	0	2	19	8	0	10	0	0	0	39	77
Key West	0	0	0	0										89
Melbourne	0	0	0	10	37	118								537
Miami (CO)	0	0	0	2	9	55	29	20	48	0	0	0	163	173
Int. Airport, Hialeah	0	0	0	1	10	53	24	16	40	0	0	0	144	178
Miami Beach	0	0	0	0	4	32	15	6	23	0	0	0	80	123
Orlando	0	0	0	17	62	147	130	109	147	0	0	0	612	650
Pensacola (CO)	0	0	0	33	175	367	328	197	230	9	11	0	1350	1435
Tallahassee	0	0	0	38	231	338	310	226	226	9	2	0	1380	1519
Tampa	0	0	0	12	45	126	113	93	141	0	0	0	530	674
West Palm Beach	0	0	0	3	16	63	31	54	53	0	0	0	220	248
GEORGIA														
Albany	0	0	0	40	273	431	362	244	246	10	14	0	1620	1763
Atlanta (CO)	0	0	11	87	344	659	609	405	398	70				2811
Atlanta	0	0	10	89	365	649	611	409	387	65	105	7	2697	2826
Athens	0	0	10	83	330	649	616	416	392	71	91	2	2710	2800
Augusta	0	0	0	79	392	562	511	354	337	56	65	0	2356	2138
Columbus	0	0	0	63	354	558	490	352	327	35	58	1	2238	2396
Macon	0	0	0	59	329	517	453	299	291	36	48	0	2032	2049
Rome	0	0	8	117	478	738	682	480	470	78	141	8	3200	3138
Savannah	0	0	0	45	291	418	370	268	272	29	23	0	1716	1710
Valdosta	0	0	0	37	237	348	315	220	239	13	9	0	1418	1525
IDAHO														
Boise	2	14	78	372	583	1039	876	727	791	447	203	172	5304	5890
Lewiston	0	18	62	355	628	805	997	660	768	461	204	151	5109	5483
Pocatello	0	1	87	448	678	1152	1069	828	954	508	249	204	6178	6976
ILLINOIS														
Cairo (CO)	0	0	4	127	478	791	865	495	531	100	103	2	3496	3756
Chicago (CO)	0	0	58	180	574	988	1122	751	914	379	305	44	5315	
Chicago	0	0	62	208	612	1022	1149	761	922	354	275	34	5399	6310
Chicago University	0	0	63	200	588	1010	1124	747	919	392	331	45	5419	
Moline	0	1	95	266	660	1078	1284	796	953	355	291	39	5818	6364
Peoria	0	0	62	231	654	1045	1159	766	910	304	247	31	5409	6087
Springfield (CO)	0	0	31	178	559	921	1050	656	791	220				5225
Springfield	0	1	54	220	618	978	1085	715	836	255	219	26	5007	5693
INDIANA														
Evansville	0	0	23	209	573	895	945	571	655	165	189	15	4240	4360
Ft. Wayne	0	0	109	257	666	1019	1126	796	925	346	299	43	5586	6287
Indianapolis (CO)	0	0	44	187	575	936	1016	659	802	237	217	20	4693	5134
Indianapolis	1	0	55	231	635	990	1052	695	842	261	250	24	5036	5611
South Bend	6	6	123	285	668	1039	1184	840	976	407	349	53	5936	6524
Terre Haute	0	0	54	217	635	996	1044	668	808	238	235	21	4916	5366
IOWA														
Burlington	1	0	68	242	646	1041	1246	759	903	324	261	35	5526	6101
Charles City (CO)	7	1	104	274	736									7504
Des Moines	0	0	66	238	665	1103	1405	759	980	352	274	39	5881	6446

Data from airport unless otherwise specified.
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MONTHLY AND SEASONAL HEATING DEGREE DAYS

1953 - 1954

Table 3A-Continued

State and Station	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total for Season	Normals July-June
IOWA (Cont'd.)														
Dubuque	4	2	150	292	741	1212	1430	871	1054	452	354	51	6613	7271
Keokuk (CO)	0	0		180	566	957	1167	667	839	238	180	24		
Sioux City	0	2	91	259	730	1175	1515	756	1047	416	284	39	6314	7012
KANSAS														
Concordia (CO)	0	0	15	182	639	917	1190	562	811	227	201	26	4770	5323
Dodge City	2	0	16	182	635	937	1036	535	761	226	221	16	4567	5058
Goodland	0	2	59	304	746	1150	1105	634	953	344	323	41	5661	6367
Topeka (CO)	0	0	14	158	544	902	1139	537	735	171	165	11	4376	4919
Topeka	0	0	19	188	581	926	1150	569	739	178	188	12	4550	5209
Wichita	1	0	9	159	542	876	1056	531	687	139	156	13	4169	4571
KENTUCKY														
Lexington	0	0	27	158	556	920	913	613	680	177	213	17	4274	4979
Louisville (CO)	0	0	12	130	471	812	890	548	655	153	163	11	3845	4279
Louisville	0	0	21	180	552	883	894	567	651	163	188	12	4111	4439
Pikeville (CO)	0	0	13	136	554	779	801	512	590	137	137	9	3668	
LOUISIANA														
Baton Rouge	0	0	0	41	226	442	338	181	224	17	23	0	1492	1595
Lake Charles	0	0	0	27	197	418	308	152	226	12	17	0	1357	1543
New Orleans (CO)	0	0	0	17	125	358	264	117	190	8	8	0	1087	1175
New Orleans	0	0	0	25	146	380	287	133	182	5	4	0	1162	
Int. Airport, Moisant	0	0	0	35	172	398	307	169	211	12	8	0	1312	1317
Shreveport	0	0	0	54	328	588	479	240	293	27	47	0	2056	2117
MAINE														
Caribou	82	152	315	643	848	1313	1813	1222	1314	877	497	186	9262	10173
Eastport (CO)	74	134												8246
Greenville (CO)	54	116	294	592	816	1188	1702	1158	1232	816	489	170	8627	
Portland	18	69	226	461	708	982	1454	998	1026	654	419	146	7161	7681
MARYLAND														
Baltimore (CO)	0	0	28	130	454	686	875	565	601	185	112	0	3636	4203
Baltimore	0	0	58	225	567	795	986	667	706	243	175	5	4427	4611
Frederick	0	1	84	278	667	878	1058	718	756	265	226	9	4940	4854
MASSACHUSETTS														
Blue Hill Obs.	15	26	125	357	579	881	1308	792	926	543	390	112	6054	
Boston	2	2	71	277	487	761	1201	870	806	442	287	61	5267	5791
Nantucket	17	31	93	300	507	727	1021	829	849	599	398	129	5500	6102
Pittsfield	44	72	228	484	744	1023	1420	991	1024	570	398	97	7095	7694
MICHIGAN														
Alpena (CO)	36	24	237	431	721	1073	1414	1000	1180	714	498	109	7437	8073
Detroit	5	1	102	264	609	964	1200	874	967	442	327	46	5801	6404
Detroit (Willow Run)	4	2	108	265	662	1001	1220	876	970	431	313	47	5899	
Escanaba (CO)	35	12	222	431	772	1185	1490	1040	1203	748	562	123	7823	8657
Grand Rapids (CO)	3	1	118	280	615	978	1232	854	995	443	322	53	5894	6474
Grand Rapids	10	7	161	328	671	1012	1279	898	1046	471	363	62	6308	7075
Lansing	17	11	169	340	679	1031	1291	937	1056	489	380	62	6462	6982
Marquette (CO)	43	47	253	385	760	1190	1472	1005	1191	754	631	157	7888	8529
Muskegon	21	8	166	347	660	964	1275	897	1041	514	386	67	6346	7089
Sault Ste. Marie	103	60	333	485	793	1253	1665	1130	1335	841	612	169	8779	9475
MINNESOTA														
Duluth (CO)	76	53	309	477	932	1487	1835	1107	1310	834	649	180	9249	9574
Duluth	57	45	313	458	939	1527	1893	1159	1385	842	637	138	9393	9937
Internation Falls	76	43	390	504	974	1696	2157	1244	1488	919	616	132	10239	10600
Minneapolis	3	2	139	274	767	1329	1693	924	1145	553	369	39	7237	7853
Rochester	9	10	199	354	822	1315	1641	925	1140	530	415	57	7417	8095
St. Cloud	20	7	227	359	876	1517	1904	1053	1258	685	454	62	8422	8893
MISSISSIPPI														
Jackson	0	0	0	74	315	583	479	286	311	33	70	0	2151	2202
Meridian	0	0	0	80	349	620	506	310	324	37	77	0	2303	2333
Vicksburg (CO)	0	0	1	69	271	552	444	250	286	25	59	0	1957	2000
MISSOURI														
Columbia	0	0	25	183	548	887	1070	617	732	185	189	22	4458	5113
Kansas City	0	0	13	151	522	890	1101	541	717	172	153	10	4270	4888
St. Joseph	0	0	27	208	595	971	1219	630	793	222	204	12	4881	5336
St. Louis (CO)	0	0	10	143	473	797	957	559	670	155	156	9	3929	4469
St. Louis	0	0	19	169	516	842	992	588	703	162	172	12	4175	4699
Springfield	0	0	13	175	548	867	963	584	672	125	183	14	4144	4693
MONTANA														
Billings	0	7	112	320	639	990	1469	684	1162	661	356	168	6568	7106
Glasgow (CO)	2	0	177	362	795	1190	1987	930	1296	789	378	145	8051	8690
Great Falls	21	17	155	330	600	1000	1696	701	1204	835	363	259	7181	7555
Havre (CO)	19	6	168	365	760	1112	1915	774	1269	825	341	190	7744	8213
Helena	11	35	184	478	785	1032	1510	842	1160	746	386	287	7456	8250
Kalispell	67	91	248	593	844	1057	1355	964	1089	755	379	304	7746	8055
Miles City	1	2	138	341	745	1097	1710	774	1182	675	352	140	7157	7822
Missoula	27	62	175	546	825	1016	1285	927	1007	665	354	276	7165	7873
NEBRASKA														
Grand Island	1	0	62	250	737	1109	1351	672	952	364	285	37	5820	6311
Lincoln (CO)	0	0	39	216	670	997	1325	637	901	304	245	26	5360	5865
Lincoln	0	0	34	218	665	1015	1369	678	924	334	119			6104
Norfolk	0	0	92	301	750	1160	1484	767	1072	425	308	42	6401	7065
North Platte	0	1	101	340	819	1152	1248	685	1007	414	341	45	6153	6546
Omaha	0	0	40	209	620	1013	1399	667	920	309	235	24	5436	6160
Scottsbluff	0	0	69	350	733	1138	1106	679	1069	446	297	69	5956	6841
Valentine (CO)	7	6	107	291	726	1124	1309	670	1127	497	344	67	6275	7075
NEVADA														
Elko	3	41	142	534	755	1365	1217	796	984	537	302	238	6914	7335
Ely	6	43	160	585	809	1262	1166	854	1024	560	331	248	7048	7443
Las Vegas	0	0	0	104	292	643	602	300	393	15	12	0	2361	2425
Reno	4	42	67	485	675	993	916	695	854	432	201	193	5557	6036
Tonopah	0	21	16	404	639	979	983	649	833	341	123			5813
Winnemucca	5	49	100	514	707	1079	960	741	910	462	238	207	5972	6369
NEW HAMPSHIRE														
Concord	12	54	190	454	711	1008	1432	985	994	579	345	85	6849	7612
Mt. Washington	489	567	745	958	1199	1592	1823	1461	1739	1222	962	596	13353	
NEW JERSEY														
Atlantic City (CO)	0	0	26	181	438	688	924	674	706	401	201	12	4251	4741
Newark	0	0	45	195	523	797	1088	707	728	358	192	7	4640	5252
Trenton (CO)	0	0	54	200	535	776	1052	674	719	322	192	14	4538	5068
NEW MEXICO														
Albuquerque	0	0	0	185	554	989	818	503	581	96	59	2	3787	4389
Clayton	0	1	32	291	612	1002	859	572	759	250	248	17	4643	5138
Raton	4	16												6417

Data from airport unless otherwise specified.
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MONTHLY AND SEASONAL HEATING DEGREE DAYS

1953 - 1954

Table 3A-Continued

State and Station	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total for Season	Normals July-June
NEW MEXICO (Cont'd.)														
Roswell	0	0	0	165	480	900	696	407	418	63	47	0	3176	3424
NEW YORK														
Albany	7	20	165	383	681	973	1436	935	941	498	301	35	6375	6962
Binghamton	27	40	190	409	712	1023	1393	952	1090	537	365	75	6813	7537
Buffalo	9	8	137	328	626	937	1282	886	988	524	335	56	6116	6838
New York (CO)	0	0	39	168	458	746	1036	688	729	360	198	9	4431	5050
La Guardia Field	0	0	29	150	439	718	1031	688	704	327	176	5	4267	4989
Rochester	14	18	152	367	624	954	1310	913	1013	534	330	48	6277	6863
Schenectady	0	7	132	344	649	915	1368	902	918	576	267	23	6101	
Syracuse	11	17	134	369	626	926	1374	893	975	503	290	33	6151	6520
NORTH CAROLINA														
Asheville (CO)	0	0	51	213	545	801	752	586	596	136	238	19	3937	4072
Asheville	5	0	95	281	647	853	803	638	605	181	270	17	4395	
Charlotte	0	0	13	97	402	673	667	462	471	112	118	1	3016	3205
Greensboro	0	0	24	146	489	763	797	544	541	150	174	6	3634	3810
Hatteras (CO)	0	0	0	33	254	426	537	396	361	97	34	0	2138	2392
Raleigh (CO)	0	0	7	98	395	619	685	466	478	110				3075
Raleigh	0	0	11	130	436	665	719	493	498	122	144	2	3220	3369
Wilmington	0	0	3	63	345	471	508	358	356	79	43	0	2226	2323
Winston-Salem	0	0	22	114	419	733	767	517	519	140	146	2	3379	3721
NORTH DAKOTA														
Bismarck	17	4	205	401	866	1279	1996	866	1268	726	420	131	8179	9033
Devils Lake (CO)	36	19	266	415	920	1513	2175	1091	1311	818	503	144	9211	9940
Fargo	20	4	214	381	892	1556	2060	1075	1219	711	456	75	8663	9274
Grand Forks	31	12	265	418	940	1594	2138	1111	1274	787	483	105	9158	
Pembina	31	20	239	375	915	1545	2275	1154	1309	804	463	108	9238	
Williston (CO)	23	8	220	391	815	1250	2034	896	1309	803	432	173	8354	9068
OHIO														
Akron	11	10	124	309	668	1020	1150	871	969	356	334	44	5866	6203
Cincinnati (CO)	0	0	16	156	518	843	885	573	691	164	184	14	4044	4532
Cincinnati	0	0	44	215	591	949	948	652	777	210	238	23	4647	5195
Cleveland (CO)	1	2	76	218	529	863	1088	784	887	341	288	35	5112	5717
Cleveland	2	3	92	253	590	948	1124	796	920	327	263	36	5354	6006
Columbus	0	3	75	254	638	955	1024	714	836	261	258	23	5041	5615
Dayton	0	0	63	219	616	984	1035	731	850	278	267	32	5075	5597
Sandusky (CO)	0	0	71	231	560	927	1094	779	884	337	268	28	5179	5859
Toledo	4	0	109	283	647	983	1173	822	950	393	317	39	5720	6394
Youngstown	22	12	141	335	651	993	1180	879	964	375	335	50	5937	6172
OKLAHOMA														
Oklahoma City (CO)	5	0	0	132	443	769	843	359	524	62	40			3519
Oklahoma City	5	0	0	124	456	788	830	379	540	79	132	4	3337	3644
Tulsa	2	0	1	115	433	736	864	391	520	60	95	4	3221	3584
OREGON														
Astoria	137	117	168	327	455	603	758	553	684	548	387	315	5052	
Burns (CO)	8	62	136	501	737	1052	1043	786	912	553	303	298	6391	6918
Eugene	39	41	101	343	488	679	747	604	684	452	306	243	4727	4779
Meacham	100	153	198	489	754	1040	1119	794	1045	736	473	428	7329	7888
Medford	0	25	40	385	486	808	793	570	621	351	157	170	4406	4547
Pendleton	1	14	65	340	574	772	939	722	758	454	204	144	4987	5204
Portland (CO)	15	20	60	236	420	610	758	558	594	405	203	176	4055	4143
Portland	32	41	91	323	485	653	797	624	649	456	254	205	4610	4632
Roseburg	13	26	69	337	441	667	722	533	652	413	266	222	4361	
Salem	52	44	94	329	514	691	761	614	678	478	287	232	4774	4574
Sexton Summit (CO)	94	175	137	430	670	804	983	608	816	577	388	411	6093	6217
PENNSYLVANIA														
Allentown	2	5	91	292	678	896	1197	783	817	374	235	17	5387	5880
Erie (CO)	2	0												6116
Harrisburg	0	0	66	237	614	842	1094	710	758	295	194	10	4820	5258
Park Place (CO)	15	27	194	366	729	1037	1340	948	1001	525	355			7175
Philadelphia (CO)	0	0	29	132	464	716	971	625	671	288	145	4	4045	4523
Philadelphia	0	0	44	170	542	784	1026	661	696	278	153	4	4358	4866
Pittsburgh (CO)	0	0	57	224	534	827	985	685	782	238	220	16	4568	5048
Pittsburgh	5	8	111	302	617	933	1091	777	869	295	294	38	5340	5905
Reading (CO)	0	0	53	191	571	786	1057	685	722	281	172	6	4524	5060
Scranton (CO)	3	17	117	316	644	880	1212	793	865	391	255	17	5510	6047
Williamsport	2	7	111	328	680	935	1206	803	838	382	230	11	5533	5898
RHODE ISLAND														
Block Island	7	6	60	266	490	721	1048	781	817	553	346	67	5162	5843
Providence	3	13	118	340	570	817	1206	825	828	459	297	50	5526	6125
SOUTH CAROLINA														
Charleston (CO)	0	0	0	29	245	375	373	256	279	29	5	0	1591	1769
Charleston	0	0	0	65	318	444	420	292	311	43	23	0	1916	1973
Columbia (CO)	0	0	1	57	302	516	497	317	329	47	51			2284
Columbia	0	0	0	72	375	569	543	352	352	63	69	0	2395	2435
Florence	0	0	4	61	343	522	513	341	342	59	49	0	2234	2507
Greenville	0	0	13	87	371	665	642	439	439	89	107	1	2853	3060
Spartanburg	0	0	19	103	386	658	651	457	437	101	103	1	2916	3044
SOUTH DAKOTA														
Huron	6	3	130	311	826	1393	1773	819	1156	546	401	58	7422	7902
Pierre	2	1	103	91	794	1198	1624	698	1165	555	341	75	6847	
Rapid City	2	6	109	295	691	1063	1387	661	1150	565	349	108	6386	7535
Sioux Falls	6	4	155	321	796	1370	1700	879	1150	499	385	51	7316	7848
TENNESSEE														
Bristol	0	0	28	167	584	855	833	596	616	140	217	18	4054	4148
Chattanooga	0	0	11	115	491	762	706	463	464	59	132	5	3208	3384
Knoxville	0	0	6	117	503	789	774	497	511	80	162	7	3446	3590
Memphis	0	0	1	114	433	712	684	399	423	68	81	0	2915	3137
Nashville	0	0	6	124	502	793	765	491	512	91	152	10	3446	3513
TEXAS														
Abilene	0	0	0	86	352	629	581	260	343	30	63	0	2344	2657
Amarillo	0	0	12	179	505	881	775	450	594	147	173	5	3721	4345
Austin	0	0	0	28	236	502	402	165	240	13	16	0	1602	1713
Big Spring	0	0	0	79										2480
Brownsville	0	0	0	0	36	223	92	43	92	5	0	0	491	617
Corpus Christi	0	0	0	0	62	323	180	64	124	7	5	0	765	1011
Dallas	0	0	0	54	314	594	576	232	315	26	55	0	2166	2272
Del Rio	0	0	0	17	181	540	344	125	176	3	8	0	1394	1407
El Paso	0	0	0	86	329	784	551	338	316	17	13	0	2434	2641
Ft. Worth	0	0	0	55	334	615	592	247	324	28	57	0	2252	2361
Galveston (CO)	0	0	0	7	117	337	243	115	186	10	9	0	1024	1211
Galveston	0	0	0	6	121	356	259	123	185	11	9	0	1070	1233
Houston (CO)	0	0	0	15	138	396	253	109	187	8	13	0	1119	1276
Houston	0	0	0	19	162	422	271	138	206	10	14	0	1242	1388
Laredo	0	0	0	2	75	367	183	43	118	1	0	0	789	781
Lubbock	0	0	4	148	471	823	717	445	504	97	115	0	3324	3587

Data from airport unless otherwise specified.
CO indicates data from city office.

MONTHLY AND SEASONAL HEATING DEGREE DAYS

1953 - 1954

Table 3A-Continued

State and Station	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total for Season	Normals July-June
TEXAS (Cont'd.)														
Midland					338	722	550	309	339	48	50	0	2356	
Port Arthur	0	0	0	28	207	431	302	164	227	15	15	0	1389	1517
San Angelo	0	0	0	85	312	631	504	241	296	23	31	0	2123	2107
San Antonio	0	0	0	15	198	489	324	142	194	8	10	0	1380	1579
Victoria	0	0	0	7	121	396	243	100	168	7	11	0	1053	1126
Waco	0	0	0	42	280	557	501	231	294	22	30	0	1957	2025
Wichita Falls	0	0	0	74	365	662	669	294	415	45	93	0	2617	3025
UTAH														
Milford	0	4	32	483	689	1283	1051	821	872	398	185	101	5919	6445
Salt Lake City (CO)	0	0	11	288	509	1024	864	768	767	293	136	83	4743	5463
Salt Lake City	0	0	28	341	560	1086	951	793	813	335	163	100	5170	5866
VERMONT														
Burlington	8	49	199	478	676	1033	1612	1058	1088	644	320	63	7228	7865
VIRGINIA														
Cape Henry (CO)	0													3307
Lynchburg	0	0	40	152	504	791	857	588	601	182	201	10	3926	4153
Norfolk (CO)	0													3119
Norfolk	0	0	7	98	403	553	713	508	499	175	112	0	3108	3454
Richmond (CO)	0													3720
Richmond	0	0	28	152	488	691	829	556	553	183	151	1	3632	3955
Roanoke	0	0	38	155	514	795	851	585	597	176	205	12	3928	4152
WASHINGTON														
Ellensburg	5	49	167	437	776	935	1276	921	877	597	303	230	6573	6542
Kelso	90	74												5239
Olympia	95	89	201	398	572	736	906	645	748	578	366	28	5362	5501
Seattle (CO)	33	25	104	278	454	617	796	548	626	482	247	200	4410	4438
Seattle	104	77	158	357	541	697	890	630	745	575	336	253	5363	5275
Spokane	11	44	149	409	733	978	1175	886	882	640	299	237	6443	6852
Stampede Pass (CO)	301	283	387	612	927	1088	1324	1038	1155	988	693	636	9432	9149
Tatoosh Island (CO)	276	242	258	339	448	587	788	581	684	607	462	356	5628	5724
Walla Walla (CO)	0	3	36	251	546	691	930	662	686	387	155	114	4461	4848
Yakima	8	26	142	401	701	881	1134	809	789	518	229	171	5809	5845
WEST VIRGINIA														
Charleston	0	1	49	184	578	841	830	596	665	165	225	13	4147	4417
Elkins	18	24	159	377	787	973	1029	799	837	285	354	53	5695	5773
Huntington (CO)	0	0	33	160	561	831	825	566	642	161	182	12	3973	4073
Parkersburg (CO)	0	0	50	215	593	854	919	625	729	193	207	14	4399	4750
Petersburg (CO)	3	0	83	248	624	807	1011	667	717	227	219	9	4615	4966
WISCONSIN														
Green Bay	19	9	203	389	763	1218	1521	1040	1110	592	468	78	7410	8259
La Crosse	1	0	129	281	744	1201	1526	896	1071	463	354	53	6719	7650
Madison (CO)	4	0	136	281	711	1153	1408	892	1059	466	363	55	6528	7300
Madison	2	1	143	323	728	1150	1397	895	1034	463	370	58	6564	7417
Milwaukee (CO)	5	0	93	264	634	1086	1254	858	992					6944
Milwaukee	2	0	123	296	682	1119	1296	887	1028	516	415	69	6433	7205
WYOMING														
Casper	6	8	124	437	767	1240	1168	771	1197	536	373	124	6751	7638
Cheyenne	10	24	139	476	775	1147	1007	724	1148	550	444	143	6587	7562
Lander	3	12	120	476	824	1231	1168	797	1180	539	368	166	6884	8303
Rock Springs (CO)	0	10	147	565	840	1178	1143	866	1069	522	313			
Rock Springs	1	21	148	571	871	1273	1179	904	1135					8473
Sheridan	0	12	139	395	765	1093	1425	731	1182	640	394	190	6966	7903
ALASKA														
Anchorage	140	256	530	941	1323	1450	1706	1633	1315	945	507	301	11047	10789
Annette	226	206	352	509	671	772	1074	873	870	814	494	409	7270	7096
Barrow	830	940	1022	1742	1983	2548	2541	2486	2331	1870	1503	925	20721	19994
Bethel	188	356	594	1121	1436	1751	2221	2074	1513	1119	584	327	13284	12880
Cordova	305	367	523	787	1032	1049	1251	1251	1170	990	642	432	9799	9615
Fairbanks	128	273	586	1267	1881	2146	2475	2299	1650	1151	441	193	14490	14158
Juneau	235	307	467	668	953	1006	1368	1152	1055	952	575	330	9068	8888
Kotzebue	428	468	671	1297	1571	2114	2244	2242	1865	1528	867	638	15933	16151
McGrath	133	335	605	1306	1868	2116	2442	2231	1670	1144	472	256	14578	14390
Nome	424	463	636	1139	1338	1823	2046	2069	1610	1354	755	521	14178	14086
Northway	156	348	730	1374	2180	2413	2692	2401	1792	1336	616	297	16335	15506
St. Paul	485	464	599	911	952	1216	1353	1583	1209	1094	920	753	11539	10839
Yakutat	304	339	490	711	990	1007	1306	1166	1120	1022	649	434	9538	9354

Data from airport unless otherwise specified.
CO indicates data from city office.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4 JUNE 1954

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Bloomington, Ill.	1	12:30 a.m.					$5,000,000		Wind	Severe wind squall with speed estimated at 80 m.p.h. Severe damage to trees, power and communication lines; 4,000 telephones out of order. Heavy damage to 6 homes and to roofs of some downtown buildings; some damage to plate-glass.
Lake Village Airport, Lake County, Ind.	1	2 a.m.			0	0	8,000	$0	Tornado	Roof torn off hangar and a number of airplanes damaged.
Wadena, Benton County, Ind.	1	2 a.m.			0	0	3,000	0	do	Roof of school building raised about 6 inches and windows on west side broken out. Limbs stripped from trees.
Winamac and vicinity, Pulaski County, Ind.	1	2:30 a.m.			0	0	500	0	do	Chicken house completely demolished. Sections of galvanized roof carried across highway. Shrubbery uprooted and trees torn up. Moved northeastward.
Goshen (17 miles northeast of), Elkhart County, Ind.	1				0	1	1,000	0	do	Tree blown on cottage.
Monon, White County, Ind.	1	Early a.m.			0	0	1,000	0	do	Damage to cement block garage. 2 trees uprooted and 3 trees broken off.
Argos, Marshall County, Ind.	1	3 a.m.			0	0	2,000	0	do	Barn moved off its foundation. 2 brooder houses and hen house picked up, carried about 650 feet, and demolished.
Ohio, southwestern, central, and northeastern portions	1	3 a.m. - noon			1	Several	1,000,000	Several thousands	Wind	Violent thunderstorms with high winds progressed across Ohio. Brunt of storm reported in Butler and Warren Counties. Began at 3 a.m. in southwestern Ohio, 9 a.m. in central, and until noon in northeastern section.
Laurel, Jackson, Clay and Knox Counties, Ky.	•1	9-10:15 a.m.	*½	15	0	0	90,000	10,000	Tornado and wind	Tornado of bounding type first struck in Mershons Community, Laurel County, and moved northeastward into Jackson County. Considerable wind damage also in Clay and Knox Counties, but no definite indication of tornado path in these latter two. Damage chiefly to residences and farm buildings.
Josephine, Scott County, Ky.	1	9:30 a.m.			1	1			Electrical	Struck by lightning while seeking shelter in barn.
Knoxville-Oak Ridge area, Knox and Anderson Counties, Tenn.	1	1 p.m.					10,000		Electrical and wind	Trees blown down, lightning struck roof at University of Tennessee. Home struck by lightning, damage $300.
New York, western portion	1	Afternoon and night							Electrical, wind, and rain	Most of storm's fury confined to Allegany, Livingston, Wyoming, Cattaraugus, and Chatauqua Counties. Lightning fired school building in Dansville, with estimated loss of $50,000, while barn near Fredonia and a farmhouse north of Great Valley burned by lightning strikes at combined loss of $7,500. 13 dairy cattle killed by lightning in various parts of storm area. 4 barns demolished by wind in Rushford-Wiscoy section, while buildings in other localities suffered less serious damage. Orchards damaged while broken and uprooted trees ripped down power and telephone lines. Some culverts and highways washed out by heavy rain. Total damage will run into many thousands of dollars.
State College, Pa.	1	Afternoon							Wind, Electrical, hail, and rain	Thunderstorm winds felled scores of trees, which in turn damaged cars, downed utility lines, and blocked streets. Lightning damage mostly light. Hail as big as half-dollars hit scattered areas, damaging crops. Heavy rains caused brief local flooding. Gusty winds reached 60 m.p.h.
Grove City (near), Pa.	1	Afternoon			0	2			Tornado	Tornado moved 8-room house 12 feet off its foundation, shattered windows, scattered furniture, and injured 2 occupants.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Erie, Pa.	1	Afternoon and Evening				3			Wind, Electrical, and rain	Thunderstorm winds toppled several small buildings, unroofed several houses, and broke or felled trees, utility lines, windows. Woman stunned by lightning, 2 men injured by flying window glass. Sudden heavy rains resulted in collapse of sanitary sewers.
Galeton, Mansfield-Canton area, Pa.	1	2-8:30 p.m.				3			Electrical, rain, wind, and hail	Series of thunderstorms, some with hail size of walnuts, some with heavy rain, damaged crops locally. Near Mansfield, auto collision during heavy rain demolished 1 car, damaged another to extent of $600, and injured 3 persons. Near Canton, lightning struck and burned out TV set; also barn and contents.
Pittsburgh area, Pa.	1	2:30-6:30 p.m.							Wind and electrical	Thunderstorm winds felled trees, TV aerials, chimneys, and utility lines throughout area, and damaged 2 homes in Braddock and at least 1 other in McKeesport. Lightning knocked a cross from church steeple. Damage occurred in each of the 2 storms that hit this area. Plane hangar unroofed at East Pittsburgh Airport.
Ohiopyle (near), Pa.	1	3 p.m.			0	0	$3,000		Tornado (possible)	A 3-minute blow smashed 100-foot building, but did not disturb chairs on nearby porch. No cloud seen, but large posts supporting building smashed or pulled from ground. Winds also destroyed 3 apple trees.
Altoona-Hollidaysburg area, Pa.	1	3-4 p.m.				1			Wind, electrical, rain, and hail	Lightning struck and damaged several buildings, ripped bricks from side of 1 home. Winds did great damage to trees and shrubs and unroofed several houses in Gaysport and Hollidaysburg area. Falling trees and branches felled utility lines, smashed 2 autos, blocked streets, and fell against houses. Spotty sections received heavy rain and/or hail which halted traffic by poor visibility, and flooded low-lying streets. Trolley cars stalled by high water. Storm area extended from near Cresson eastward across central and northern Blair and Huntingdon Counties, spending most of its energy before entering Mifflin County. Some hail ½ inch thick and 1½ inches in diameter. Apples, strawberries, and truck gardens near Hollidaysburg hard hit by hail.
Johnstown area, Pa.	1	3:30 p.m.							Wind and electrical	Storm labeled "twister" by newspapers. Streets littered with broken branches, felled trees, and broken utility lines. 2 radio stations knocked off air due to power failure. 3 large transformers set afire by lightning strikes.
Tyrone area, Pa.	1	3:30 p.m.							do	Thunderstorm winds lifted front porch over rest of house, felled scores of trees, downed power lines, and partly unroofed barn. Lightning killed calf. 2 later storms same evening did lesser damage.
Bakersfield, Pecos County, Tex.	1	6 p.m.	880	8	0	0	2,600	$0	Tornadoes and hail	Fencing, 2 windmills, and 1 barn destroyed by tornado. Hail damaged several automobiles. Largest hail 4 inches in diameter. Tornado traveled northeastward. 3 funnel clouds formed, but only 1 touched ground.
Knox, Pa.	1	Evening		3	0	0			Tornado and electrical	Large bank barn and 3 houses unroofed, orchards uprooted, tops of other trees twisted off by hit-skip twister, which apparently moved to east. Lightning struck and fired frame home, causing $3,500 damage.
North Oakland-Chicora, Pa.	1	6:30 p.m.	50-150	10	0	0			Tornado and rain	Tornado uprooted scores of trees, some 40 feet high, ripped roofing from homes, destroyed at least 2 barns, but left auto almost untouched on remaining barn floor. Reported as "Screaming like thousands of people yelling at once". It exploded barn and garage as it passed over them, tore through grove of oak trees, damaged houses and farm buildings, ripped roofs and felled utility lines, and knocked out 2 oil derricks. Path of tornado wandered back and forth as it moved northward. Power off all night. Highway blocked by debris from wind and mud from rain. Several people saw funnel cloud as it swayed across terrain. One farmer's loss estimated at $5,000; another's at $10,000 property damage and $1,100 loss to livestock and crops. Corn crib shattered, corn strewn over several acres. Slate from roof spread over 20 acres. Farm truck dragged westward, overturned, then dragged eastward. Large greenhouse moved 3 feet off foundation, then demolished by falling tree. Woman and 2 children pinned in auto by falling tree. Following heavy rain caused water damage in homes

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Hall and Jackson Counties, Ga.	1	7 p.m.							Electrical	Lightning started fire in a dwelling in Gainesville. Considerable damage to power lines in area.
Valley View, Salt Creek, Chalk, Sneedville, Hackberry and Paducah, Cottle, County, Tex.	1	7:30 p.m.	*15	25	1	14	$1,000,000	$5,611,500	Tornado and hail	A number of houses completely destroyed and many heavily damaged. Baby killed when home blown away. Gymnasium at Valley View flattened. Brick building in Paducah destroyed. Wheat and cotton heavily damaged. About 200 outbuildings completely destroyed. Storm moved southeastward. Tornado damage 90 percent; hail 10 percent.
Wichita, Logan, and Thomas Counties, Kans.	1	7:30-11 p.m.		80			Light	720,000	Hail	In several good-sized areas, mostly in western sections, hail up to 1 inch in diameter damaged wheat and other grains.
East Smithfield (near), Pa.	1	8:30 p.m.							Electrical	Lightning struck 2 barns, 1 destroyed by resulting fire and the other minor damage to corner.
Iowa Park and Wichita Falls, Wichita County, Tex.	1	8:55 p.m.	25-50	5	1	4	49,000	1,000	Tornado	Straight line winds above 100 m.p.h. at WBAS, Wichita Falls, before anemometer blown from support. Tornado formed 1½ miles northeast of Iowa Park; destroyed 2 homes; moved southeastward to destroy outdoor theater screen on Iowa Park Road and radio tower at Wichita Valley. Numerous reports of damage to signs, plate-glass windows, roofs, small buildings, etc.
Richmond, Columbia, and Lincoln Counties, Ga.	1	10 p.m.					Considerable		Electrical, wind, and hail	80 or more trees down in Augusta. Heavy damage to power lines. Homes and other structures damaged by wind and lightning. Extensive wind damage to yachts and docks on Clark Hill Reservoir. Egg-size hail damaged crops in Lincoln County. Overall damage estimated well into five figures, largely property.
	1									Minor storm also reported in Henry County, Ky.
	1									Minor storms also reported at Birmingham and Steele, Ala.
	1									Minor storm also reported near Wallace, Kans.
	1									Minor storms also reported at Anderson, Bloomington, Churubusco, Idaville, Madison, Raleigh, and Shelbyville, Ind.
	1									Minor storm also reported in Vermont and New Hampshire.
	1									Minor storm also reported at Radford, Va.
	1									Minor storm also reported at Greenville and Anderson, S. C.
McAlester and vicinity, Pittsburg County, Okla.	2	1:45 a.m.			0	0	1,000	0	Tornado and wind	Tornado aloft observed southwest of McAlester at 1:45 a.m., later reported east of McAlester. No damage by tornado. Scattered wind damage to buildings in and near McAlester. Storm moved northeastward.
Minneapolis (4 miles southwest of), Ottawa County, Kans.	2	2 a.m.					10,000		Electrical	Barn and contents of machinery and hay burned.
Fredonia (5 miles southeast of), Wilson County, Kans.	2	5 a.m.							do	Home, contents, and nearby buildings burned.
Birmingham, Ala.	2	Afternoon					4,500		Wind, electrical, and hail	Wind 54 m.p.h. at Birmingham Airport. Several buildings set on fire by lightning and 1 small building burned. Hailstones averaged ½ to 3/4 inch in diameter.
Chillicothe (south of) to Wheeling (5 miles north of), Livingston County, Mo.	2	5:30-6 p.m.	150	10	0	0			Tornado	Funnel cloud observed. Minor damage to small buildings and wheat fields.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Lake Creek, Delta County, Tex.	2	5:30 p.m.	1000	7	1	8	°$10,000		Tornado	Destroyed 3 houses, 3 miles northwest of Lake Creek and moved southeastward, touching ground several times. Woman fatally injured when home destroyed; other 2 houses vacant. Cotton and corn crops cut off or uprooted.
Union County, Iowa	2	8 p.m.					10,000		Electrical	Destroyed house in Creston.
Milwaukee, Wis.	2-4	8 p.m. on 2d-1 a.m. on 4th				4	500,000		Wind and rain	Wind recorded as high as 54 m.p.h. Rainfall measured 2.86 inches. Wind blew down trees, TV antennas, neon signs, and electrical wires. City's electrical system had 174 primary wires and 4 secondary lines downed and out of service. Basements flooded by the thousands, sewers choked and many new homes had basement walls cave in. Storm moved northeastward.
Lorena, McLennan County, Tex.	2	8:57 p.m.			0	0	0	$0	Tornado	Southeast of Lorena; moved northeastward. Lasted about 5 minutes and did not touch ground.
Tomato, Mississippi County, Ark.	2	Night			0	1	6,000	0	do	11 houses damaged.
	2									Minor storm also reported at Lead Hill, Boone County, Ark.
	2									Minor storms also reported at Talladega and Anniston and vicinity, Ala.
	2									Minor storms also reported at Salina and near Harveyville, Kans.
	2									Minor storms also reported in Mason and Fulton Counties, Ky.
Newton (10 miles north of), Newton County, Miss.	3	6 a.m.	300	7	0	3	8,000	2,000	do	Moved from Berry Community, 10 miles north of Newton, to Blue Springs Church. 1 home destroyed, 4 damaged, and 3 barns destroyed.
Ohio, most of State	3	Day			1	Several	°Several thousand		Wind	Squall line progressed southeastward across State.
Washington (7 miles north of), Ga.	3	3 p.m.		2	0	2			Tornado	Pillar-like cloud observed. Path not continuous. Damage at 3 locations on Tignall-Sandtown Road. Home garden and farm shop destroyed at 1 location, oak tree twisted off at another, and 2 rooms torn from home at third location.
Flagler Beach, Fla.	3	4-4:30 p.m.			0	0	0	0	Waterspouts	3 waterspouts southeast of Flagler Beach moved southeastward and dissipated over water. Thunderstorm and locally heavy rain on shore.
Greater Chicago area, Ill.	3	Evening				2	200,000		Wind	Heaviest damage in suburban area of Chicago, with heavy damage to trees, power and communication lines, and to canopies, awnings, and porches. Minor injuries to 2 persons from flying glass and wind.
Butler (near), Pa.	3	6 p.m.							Wind and rain	Freak windstorm swept across open hillside, took 25-x 50-foot roof and flipped it over hillside. Inside home, wind toppled steel cabinet breaking all family's dishes. Heavy rains immediately followed, soaking family, and all furniture and personal belongings.
Ripley, Lauderdale County, Tenn.	3	10 p.m.					100,000	50,000	Rain and wind	Heavy downpour caused damage to bridges on Highway 88. 1 hangar destroyed at Halls Airport. Cotton destroyed by flood. Corn and beans suffered from strong winds. First floors of many homes flooded.
	3									Minor storms also reported at Aiken, Columbia, and Kershaw City, S. C.
	3									Minor storm also reported at Sylacauga, Ala.
	3									Minor storm also occurred at Ponte Vedro Beach, Fla.
	3									Minor storm also reported at Michigan City, Ind.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Denton, Fergus County, Mont.	4	5 p.m.					Considerable		Hail	Damage to rubberoid roofs and windows. Hailstones from walnut size up to hen's eggs.
Coffee Creek (2 to 5 miles south of), Fergus County, Mont.	4	6 p.m.	*3					Considerable	do	Some hailstones size of hen's eggs.
	4									Minor storm also reported at Great Falls, Mont.
	4									Minor storm also reported at Presidio, Tex.
	4									Minor storm also reported at Silver Lake, Ind.
Parker (3 miles west of), Douglas County, Colo.	6	1:30 p.m.	7	**135	0	0	$300	$0	Tornado	No eye witnesses. 2 sheds demolished. Position of debris indicates tornado. Moved northeastward.
Colorado	6	Afternoon	*200	350		1	50,000	200,000	Wind	Strong winds over entire State.
Pine Bluffs, Laramie County, Wyo.	6	4 p.m.	*8	20			1,000	100,000	Hail	Crops practically destroyed.
Kimball and Cheyenne Counties, Nebr.	6	4-8 p.m.	*10-20	60	0	0	110,000	700,000	Hail and tornado	Hail accumulated 2 to 4 inches on level near Kimball. Tornado damage $20,000 to property, remainder of damage by hail.
Perkins County (western portion), Nebr.	6	5:30-6 p.m.	*15	30			Light	20,000	Hail	
Hyannis (near), Nebr.	6	5:30-6:15 p.m.	*1	4½	0	0	63,000	10,000	Tornado and hail	Elaborate set of ranch buildings destroyed. Tornado damage estimated $60,000, remainder hail.
Nebraska, southwestern portion	6	Evening					1500-2000	Considerable	Wind	Property damage minor, but widespread. Considerable corn blown out, cut off, or covered by blowing sand and dust.
Todd County, S. Dak.	6	8-11 p.m.		36			3,000	10,000	Hail	In path from State line south of Lakeview northeastward to Carter, cars, windows, and roofs of buildings hit by 3/4 inch hail. REA line damage $1,300. Crop damage was 30 to 50 percent.
South Dakota, northeastern section	6-7	9:30 p.m. -11:30 a.m.				1			Wind, rain, and hail	Winds of 50 m.p.h. and gusts to 82 m.p.h., with "cloudburst" in local area, damaged trees and buildings. Power failures frequent (58 circuits and 1,800 phones out of order). Flash floods in local areas caused severe damage to fields and crops. Most all towns and villages in this area reported 1 to 3 inches of rain. 1/4 inch to golf-ball size hail in a few locations. Storm moved northeastward.
Brown and Keya Paha Counties, Nebr.	6	10 p.m.	Variable	18			500	Several thousand	Hail	Stones golf ball size to clumps 13 inches in circumference.
Bryan County (northern portion), Okla.	6	10-10:30 p.m.	*2	8			10,000		Wind	Most damage in Kenefic-Caddo area.
Ford, Ford County, Kans.	6	11:05 p.m.		½	0	0	1,500	0	Wind (possible tornado)	North side of large cement block store building pulled out. Small buildings and trees damaged. Moved northeastward.
	6									Minor storm also reported near Chappel, Nebr.
	6									Minor storm also reported in western Kansas.
Colorado, west of Continental Divide	7	Early morning	*150	200				300,000	Frost	General frost destroyed about one-half of hay crop. Damage to other crops.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
North Dakota, Eastern half	7-8	A.m., 7th-a.m., 8th			0	4	$1,000,000	$1,000,000	Wind, rain, and tornadoes	Intense low moved northward, with center passing just west of Devils Lake into Canada. Winds of 60 to 100 m.p.h. reported for several hours, mostly from westerly to south-westerly direction; Fargo reported winds to 95 m.p.h. from southeast. Storm appeared most intense in northern part of State. Heaviest rains in Pierce, Benson, Towner, Rolette, eastern Bottineau, and eastern McHenry Counties. More than 6 inches measured at Rolette and amounts to 10 to 14 inches estimated south of Rolette. Resulting floods rivaled some of biggest spring floods from snowmelt in past 75 years. Tornado funnel reported at 10 a.m. on 7th south of Fargo, but did not reach ground. Tornado also reported at edge of Jamestown Airport, but apparently did no damage.
Minnesota, western and central portions	7	A.m. and p.m.			2	10	2,000,000		Wind	Wind gusts of 80 m.p.h. recorded at Fergus Falls airport before instrument blown away. Extensive property damage resulted. Greatest single loss occurred at Kennedy, Kittson County where steel framework of new high school gymnasium under construction was badly twisted. Storm especially severe in Detroit Lakes-Park Rapids area, where numerous trees uprooted, many barns and outbuildings demolished, and substantial damage to homes, town buildings, and airports. Many lake cottages, docks, and small boats wrecked or damaged. Many poles and wires down. Severe damage to trees in Itasca State Park, Beltrami and Pine Island State Forests and Chippewa National Forest. Some livestock and much poultry and small birds perished. Growing crops damaged, mainly from blowing of lighter soils. Storm moved east-northeastward. 1 death caused by drowning, the other from burning when wind-whipped flames prevented rescue.
Tunnelton, Preston County, W. Va.	7				1	4	Minor	Minor	Electrical	Killed and injured by lightning.
Garvin, Murray, and Comanche Counties, Okla.	7	5:30-8:35 p.m.			0	0	50,000	40,000	Hail, wind, tornado, and electrical	Hail, marble-sized, damaged wheat crops on 3 farms near Sterling. Damage to wheat and corn crops on several farms southwest of Lindsay. Several buildings in Garvin County also damaged. Considerable hail damage to buildings in Rush Springs area. Barn near Stratford burned after being struck by lightning with loss estimated at $10,000. Tornado path northwestward from Davis to Wynnewood, 880 yards wide and 12 miles long, at 8:35 p.m.
Big Spring, Howard County, Tex.	7								Hail	Heavy damage. Hailstones 1½ inches in diameter.
San Angelo and North Concho Lake area, Tom Green County, Tex.	7	5:50 p.m.	*4				1,500,000		Wind and hail	Hail damaged automobiles, windows, neon signs, and roofs. Largest hail 3 to 4 inches in diameter. Hail damage 50 percent. Storm moved southward.
Jefferson, Johnston, Murray, Love, and Marshall Counties, Okla.	7	9-10 p.m.				1	31,500	10,000	do	Severe damage in western part of Love County near Courtney and in Marshall County near Madill. 1 person at Ryan injured when tent blown down. Property damage by wind, crop by hail.
Champaign County (southwestern portion), Ill.	7	10 p.m.	*2	7					Hail	Hail reported in many localities, but most severe between Bondville and Tolona. Heavy damage to corn and soybeans. 150 claims filed. Hailstones size of walnuts reported.
	7									Minor storms also reported in Sioux and Henry Counties, Iowa.
	7									Minor storms also reported in Cincinnati and Zanesville areas, Ohio.
	7									Minor storm also occurred at Clewiston, Fla.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Pemiscot County, Mo.	8	4 p.m.	*3-5	5-10					Hail	2 areas affected by heavy hail in northern Pemiscot County between Hayti and Wardell. Crops severely damaged. Hailstones size of hens' eggs reported.
Yellow Springs, Ohio	8	4 p.m.				2	°$500		Rain and electrical	4.75 inches of rain in 2 hours flooded business and residential districts, washed out 1 bridge, damaged another, blocked 5 roads, and flooded city water works. Lightning struck woman. Several traffic accidents.
Rooks, Osborne, Mitchell, Smith, Jewell, and Republic Counties, Kans.	8	4-7 p.m.						$225,000	Hail	Damaging hail locally within 6-county area. Stones up to golf-ball size in Osborne County where most of reported damage occurred.
Randolph and Clay Counties, Ark.	8	3-4:30 p.m.	12	45			17,000	10,000	Hail and wind	In Clay County hail 1/4 inch in diameter caused crop damage estimated at $10,000; wind damage to buildings, $2,000. In Randolph County $15,000 wind damage to property.
Lane, Ness, southern Trego and Rush Counties, Kans.	8	5:30-6 p.m.						27,500	Hail	Scattered areas of hail damage to crops. Estimate includes damage in Lane and Rush Counties only.
Borger, Hutchinson County, Tex.	8	5:35 p.m.					10,000		Wind and hail	Severe thunderstorms; winds to 86 m.p.h. Damage to TV antennas, trees, plate-glass, and a few frame and tin buildings.
Washington County (northern portion), Pa.	8	Evening							Electrical, rain, and hail	Lightning struck and partially damaged 1 house. Sudden heavy rains flooded cellars, washed driveways, and caused wire trouble. Series of storms moved across area, some with hail.
Gage County (southeastern portion), Nebr.	8	Evening					Light	30,000	Hail	
Thayer County, (southwestern portion), Nebr.	8	6:30-6:50 p.m.	*2	3				10,000	do	Stones size pigeon eggs or little larger.
Beaver, Harper, Woods, Alfalfa, and Grant Counties, Okla.	8-9	6:30 p.m. -2 a.m.			0	0	20,000	20,000	Wind and Tornado	In Beaver County, $1,600 wind damage to buildings and $5,000 damage to wheat crop. Minor damage in Harper County. Winds 70 m.p.h. in Woods County caused minor damage to crops, and damaged several small buildings (loss estimated at $3,000.) Tornado observed aloft by several persons at 9:20 p.m., 3 miles west of Alva. Tornado moved to north. No damage by tornado. 1 barn blown down; TV aerials down; power disrupted; some damage to wheat in Alfalfa County. A number of roofs in Wakita area, Grant County, blown off.
Wake, Franklin, Nash, Wilson, and Johnston Counties, N.C.	8	Night					1,000	392,000	Hail and wind	Damage mostly to tobacco; some damage to corn and cotton.
	8									Minor storms also reported at St. Marys and Piedmont, W. Va.
	8									Minor storm also reported in Christian County, Ky.
	8									Minor storm also reported at Marion, Ind.
	8									Minor storms also reported in Clay and York Counties, near Tecumseh, Giltner, Aurora, and Sargent, Nebr.
	8									Minor storms also reported at Coldwater and Merrill, Kans.
	8									Minor storms also reported in Grundy County and southwestern Iowa.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Iowa, central portion	9	Midnight-4 a.m.					$21,500		Wind, electrical, and rain	Wind destroyed farm buildings, downed trees, and broke windows. Lightning burned 4000-bushel corn crib and damaged house. Rain drowned thousands of young turkeys and damaged highways.
National Reactor Testing Station (47 miles west of Idaho Falls), Idaho	9	1:10-1:17 p.m.					0	$0	Tornado	Slender funnel-shaped cloud observed 15 miles northeast of central Facilities stretching two-thirds of way from cloud base to ground. No horizontal movement of cloud base observed.
Lamont, Fremont County, Idaho	9		70	1/4			5,000		do	Tornado not witnessed, but distribution of debris suggests twister. A 28 by 50 foot barn and 2 combines in storage demolished.
Paris-Centerville (near), Pa.	9-10								Rain and hail	Heavy rain and hail hit Paris area hardest on 9th, with estimated crop damage of $15,000. On 10th in Centerville area, heavy rains and washing did estimated damage of $1000 on 1 farm.
Milwaukee, Wis.	9	3 p.m.			2	2	150,000		Electrical, rain, and wind	Severe thunderstorms moved northeastward. Lightning struck and killed 2 boys standing under tree for shelter. Lightning also struck 3 churches and 1 hospital. Several storm sewers backed up, flooding some industrial basements - 1 firm reported $100,000 loss due to flooding. Damage of $20,000 as wind blew down roof arches of church that was being constructed.
Condon (about 10 miles east of), Oreg.	9	3:30-4:30 p.m.	880-1760	12				15,000	Hail and rains	Fairly heavy hailstorms with stones up to 5/8 inch in diameter extended over area of several square miles, causing estimated damage of $15,000 to wheat and barley. Fairly heavy rains accompanied storm and produced considerable washing on summer fallow hillsides.
Racine (near) Wis.	9	5:30 p.m.					10,000		Electrical and rain	Lightning struck 2 barns just west of Racine, destroying 1. 2 homes hit in Racine proper, minor damage. Thunderstorm moved eastward.
Spartanburg, S. C.	9	6:30 p.m.				3			Electrical	Shock and minor injuries.
Winnetka, Ill.	9	7:50-8:10 p.m.					500		Hail	Damage mostly to greenhouses. Hailstones varied in size from ½ to 1½ inches irregularly shaped.
Calhoun County, Iowa	9	10-11 p.m.	440	9	1	0	200,000		Tornado	Moved northeastward from northeast of Lake City to southeast of Rockwell City, damaging or destroying buildings on 6 farmsteads. Farmer sleeping in 1 home killed.
Pilger, Nebr.	9	10:30 p.m.			0	0	0	0	do	Funnel cloud passed over town, but did not reach ground.
Wake, Lenoir, Lee, and Hoke Counties, N. C.	9	Night			1	2		17,000	Electrical and hail	Boy Scout killed and 2 injured by lightning at Camp Durant, near Raleigh. Damage to corn, cotton, and tobacco in vicinities of Quewhiffle, Blue Springs, and Stonewall.
	9									Minor storms also reported at Greenwood and Greenville, S. C.
	9									Minor storm also reported in southern Sumner County, Kans.
Iowa, northwestern portion	10	Throughout day				1	600		Electrical	Damaged houses and injured 1 woman in house.
Doylestown (near) Pa.	10	Noon				1	°25,000		do	Lightning struck large stone barn, resulting fire destroyed barn and contents. 1 person injured fighting fire.
Montgomery, Ala.	10	Noon				1	5,000		Wind	Winds estimated at 75 to 80 m.p.h. 5 commercial planes damaged considerably at Allenport Airport.
LaGrange (5 miles east of), Ga.	10	Afternoon	700	2			200	400	Wind and hail	Damage occurred in Mountville - Big Spring area. Hailstones pullet-egg size.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Sidney Center, Delaware County and Unadilla, Otsego County, N. Y.	10	Afternoon					°$800,000		Rain and hail	Very heavy thundershowers caused flash flooding at Sidney Center and Unadilla where buildings swept from their foundations, lower floors and basements flooded, lawns and gardens covered with debris, bridges washed out, and highways eroded. Water supply reservoir at Sidney Center broken and village left without water for domestic use.
New York, western portion	10	Afternoon and evening							Electrical, wind, and hail	In Buffalo area hail did serious damage to greenhouse glass and roofs, with hailstones ranging up to 2 inches in diameter. Fruits and vegetables escaped serious injury. Lightning burned barn at Lockport with loss estimated at $10,000, and 2 at Amherst with loss of $25,000. Streets and cellars flooded by heavy rain which clogged storm sewers.
Catawba, Durham, Person, and Yadkin Counties, N.C.	10	Afternoon				1	20,000	$1,000	Electrical and wind	Boy knocked unconscious by lightning near Hickory. 1 building destroyed by fire due to lightning and several buildings unroofed by wind in Durham County. Damage to tobacco in Mt. Tirzah and Booneville communities.
Florida, northeastern portion	10	Afternoon and night					1,000	1,146,000	Thunderstorms	Numerous thunderstorms, many accompanied by hail and high winds. Major portion of crop loss suffered by tobacco and largely due to hail. Most of destructive storms were in 30x120 mile area extending from northern Jefferson County to eastern Alachua County. Counties reporting storms were: (1) Jefferson - Small amount of property and crop damage by wind and hail late afternoon vicinity of Monticello. (2) Madison - Wind and hail in southwestern and northeastern sections early part of night. Crop losses by wind $25,000, hail $40,000. ½ inch hailstones. (3) Lafayette - Wind and hail in eastern portion. Property damage by wind $1,000. Crop losses by wind $4,000, hail $2,000. ½ inch hailstones. (4) Suwannee - Wind and hail about 5 p.m. in southwestern section and about 6 p.m. in southeastern section of county caused heavy damage. Hailstones guinea-egg to ice-cube size. Overall losses estimated by County Agent to be well over one million dollars. Major portion of damage suffered by crops. (5) Columbia - Hail in southern portion of county about 5 p.m. caused crop losses estimated at $75,000. ½ to 1 inch hailstones. (6) Alachua - Wind and hail in eastern portion of county about 5 p.m. caused small amount of property and crop damage. ½ inch hailstones. (7) Duval - Saucer-shaped hailstones up to 1 inch diameter covered ground over small area about 6 p.m. in south portion of county. Only minor damage. (8) Volusia - Wind caused some property damage in vicinity of DeLand about 5:30 p.m.
McAlpin, Suwannee County, Fla.	10	3:30 p.m.	*1	2	0	1	°25,000	Some	Tornado, hail, and rain	Developed in thunderstorm. Accompanied by heavy hail and heavy rain. Affected area oriented north-south. Direction of movement not determined. Store building destroyed and 6 homes damaged.
Northern Mifflin County and Snyder County, Pa.	10	3:30 p.m. - 8 p.m.	*1	Several					Electrical, hail, and rain	Series of 3 storms. In Siglerville area, hailstones walnut size; near Naginey, irregular shaped hailstones ranged up to 6 inches in diameter; near Milroy, bigger than golf ball. 1 farmer lost two-thirds of apple, peach, and cherry trees and had 12 house windows knocked out. Nearby cattle injured by hail, with several reported dying. Large-sized hailstones remained on ground 12 hours after storm in vicinity of Naginey. Heavy rains washed out some fields and roads. Gardens and other crops also hard hit.
Kearney County, Kans.	10	4-6 p.m.			0	0	16,000	0	Tornado, wind, and hail	Tornado, identified by debris, demolished private hangar and plane 12 miles north of Lakin. Path not established. Wind and hail as large as tennis balls caused heavy damage over area from Lakin northeastward. Moved northeastward.
Hardin (12 to 14 miles west and northwest of), Mont.	10	4 p.m.	*4	8				10,000	Hail	Damage to winter barley, winter wheat, and alfalfa.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Kearney, Scott, Lane, Gove, and Sheridan Counties, Kans.	10	4-8 p.m.	*20	130			$7,500	$89,000	Hail and wind	Wind-driven hailstones of 1/4 inch diameter up to size of tennis balls or larger beat down wheat and other crops in large areas. No damage estimates obtained from Gove and Sheridan Counties, but hail occurrences there would indicate total damage double figure given.
Sublette (vicinity of), Haskell County, Kans.	10	6 p.m.	*2	14	0	0	20,000	0	Wind (possible tornado)	Severe local wind damaged roofs, blew out plate-glass window, and destroyed storage bins. (Reports of funnel seen not confirmed and debris indicated straight wind. Billows of dust obscured clouds.)
Bloserville-Mifflinburg Area, Pa.	10	6:15-6:45 p.m.							Electrical and rain	Lightning fired and burned bank barn and farm equipment near Bloserville, estimated loss $25,000. Lightning struck and damaged house in Mifflinburg. Lightning struck new school near Mifflinburg, toppled much of 50-foot chimney onto roof of school, puncturing roof, and damaged wiring; following heavy rain caused much water damage inside school; estimated $25,000 loss.
New Brighton-Beaver Falls-Ellwood City Area, Pa.	10	7:30-10:30 p.m.				3			Electrical, Tornado, rain, and hail	Series of evening thunderstorms hit area with probable tornadic action in New Brighton area. Brick shed, 60 x 200 feet, had roof lifted off and dropped on adjacent kilns; damage $3,500; ball park dugout roof and walls hit by twister at New Brighton. Felled trees damaged 5 cars, disrupted utility lines for 3 hours, and cluttered highways. Lightning struck and burned 2-story barn and contents near Ellwood City, caused minor damage in other strikes in Beaver Falls-New Brighton area. 3 injured in auto accidents due to storm, 2 cars demolished. New Brighton area damage estimated at $18,500. Hail, up to golf-ball size caused over $1000 damage to greenhouse and fruit trees near Ellwood City.
Kalvesta (vicinity of), Finney County, Kans.	10	8 p.m.	*7	15	0	0	25,000	0	Tornado	Property damage to buildings on several farms in strip from about 3 miles south of Kalvesta to 12 miles north in eastern Finney County.
Pittsburgh area, Pa.	10	9:30-11 p.m.			0	0			Electrical, tornado, rain, and hail	Lightning struck and damaged at least 6 houses and struck trees which in turn damaged 3 houses as they fell. Lightning struck South Hills home, with estimated fire and water damage of $20,000. South Hills area and Carnegie area hard hit by heavy rains which overtaxed sewers, flooded basements, marooned 5 cars and caused an estimated $5,000 damage to paint and equipment in garage basement. Power lines hard hit in many sections. A few foot bridges washed out and 1 house had foot section of foundation knocked out by raging waters. "Baby twister" reported near Donaldson's Corners ripped out 16 trees in 1 section and did severe damage to tree tops in another. Rain, wind, and scattered hail damaged crops. Allegheny County Airport reported wind speed of 90 m.p.h. Garage concrete block side wall blown away.
South Dakota, eastern section	10-11	10 p.m.-2 a.m.							Wind and hail	From Pierre to Sisseton, thousands of dollars damage from heavy hail and wind gusts to 85 m.p.h. Pierre reported $100,000 damage; Aberdeen $125,000. Farm buildings along route suffered minor to heavy damage. Storm moved northeastward.
Indiana-Johnstown area, Pa.	10	10-11 p.m.							Electrical, winds, and rain	Thunderstorm produced gusty winds which unroofed part of 1 building and did much tree and wire damage in Indiana area. Lightning struck several houses, but only minor damage. Local heavy rain briefly flooded low spots and did some washing. In Johnstown area, machine shop, house, and church hit by lightning. Resulting fire in machine shop did $12,000 damage. Church dome, carillonic bells, and choir loft walls damaged. 3 autos damaged by falling trees. Warehouse roof partially torn away. Lightning fired barn near Spangler, loss $12,000.
Monongahela-Donora-Uniontown, Pa.	10	10:30 p.m.				1			do	Lightning struck auto, injuring driver, in Uniontown. Elsewhere, lightning blew fuses and caused short power interruptions. High winds in Uniontown and Donora felled trees and wires. Sudden heavy rains in all 3 areas overtaxed sewers, filled streets with up to 2 feet of mud from hillsides, and temporarily flooded streets and a number of basements.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons: Killed	Number of persons: Injured	Estimated damage: Property (exclusive of crops)	Estimated damage: Crops	Character of storm	Remarks
Pukwana (4 miles south of), Brule County, S. Dak.	10	11:55 p.m.	30	1	0	0	$6,000		Tornado	Strong winds, a calm, then roar heard by farm residents near east shore of Red Lake. Barn, garage, and chicken house demolished. Foundations of garage and chicken house uprooted and twisted. 20 feet of each fence line torn, showing path from west to east. 2 windows sucked out of house.
	10									Minor storm also reported at Opp, Ala.
	10									Minor storm also reported in Bismarck, N. Dak.
	10									Minor storms also reported in Lima, Salem, and New Sparta areas, Ohio.
	10									Minor storm also reported in Texas County, Okla.
	10									Minor storms also reported at Waterloo and Greenfield, Ind.
Johnson County, Nebr.	11	12:30-7 a.m.	*2	6	0	0	1,000	$5,000	Tornado and hail	Stones size of peas to walnuts. Property damage by tornado, crop by hail.
Carpenter (10 miles west of), Spink County, S. Dak.	11	12:55 a.m.	40	1	0	0	500		Tornado	Combination store and filling station hit by tornado that moved northeastward. Gas pump twisted from foundation; plate-glass window blown out, one in.
Crandall (8 miles north of), Day County, S. Dak.	11	1:15 a.m.		2	0	0			do	3 buildings demolished. In adjacent area 1 windmill and garage also destroyed. Moved northeastward.
Dana and Edneyville, Henderson County, N. C.	11	1:30 p.m.						17,000	Hail	Fruit and other crops damaged.
Stevens and Grant Counties to Riley and Jackson Counties, Kans.	11	2:30-11 p.m.	*50	350			75,500	1,170,000	Hail and wind	Apparently numerous strips 1 to 4 miles wide by 10 to 20 miles long within general outlined area. As many as 3 storms at a given location. Hailstones generally 1/4 inch to 1 inch in diameter, but up to hens' egg size in Clay County. Crop damage: hail 1,155,000; wind 15,000. Property damage: hail 20,500; wind 55,000.
Milton Experimental Station (2 miles south of), Fla.	11	3 p.m.	*1	4					Hail	Stones 3/4 inch in diameter damaged corn and cotton.
Swisher, Floyd, and Hale Counties, Tex.	11	4 p.m.	*6	30					do	Devastated wheat crop. 30,000 acres of cotton affected; 15 to 20,000 acres total loss.
Minnesota, east-central portion	11	P.m.					8,000		do	Heavy hail that accompanied severe thunderstorms caused considerable damage in places to real property. Some damage to growing crops. Some hailstones reported to be size of baseballs.
Grantsburg and vicinity, Wis.	11	P.m.							do	Many windows broken, cars dented, and crops laid low due to hail. Because duration of hail short, damage to crops reported light. Hailstones observed as large as golf balls and undersized baseballs. 1 stone measured more than 5 inches in circumference.
Dawsonville, Ga.	11	5:30 p.m.					Considerable		Electrical	Considerable damage to home.
Bloserville (near), Pa.	11	6:15 p.m.							do	Lightning struck and burned barn, machinery, and corn crib, estimated loss $15,000. At another farm near Shippensburg, lightning set fire to tool shed, also killed cow.
Great Bend (10 miles east of), Barton County, Kans.	11	7 p.m.			0	0	0	0	Tornado and hail	Press report that funnel sighted, but did not touch ground. Hail in general area.
Voda (3/4 mile north of), Trego County, Kans.	11	7:30 p.m.			0	0	2,000	0	Tornado	3 buildings on farm severely damaged.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Dunlap (3 miles northeast of), Morris County, Kans.	11	Evening or night			0	0		$0	Tornado, rain, and hail	Roof torn off basement home. Heavy rain. Considerable hail in area.
Terlingua, Brewster County, Tex.	11	8 p.m.		5	0	0	$625	0	Tornado and hail	Moved southwestward, more or less along Terlingua Creek. 2 windmills blown down; 2 houses unroofed; windows broken. In sparsely settled ranch country.
Mullinville (5 miles north of), Kiowa County, Kans.	11	8:05 p.m.			0	0	0	0	do	Report of tornado-type cloud, not reaching ground. Hail up to ½ inch in diameter.
	11									Minor storm also reported in Roosevelt County, N. Mex.
	11									Minor storms also reported in central and northeastern portions of Minnesota and in International Falls and Owattonna vicinities, Minn.
	11									Minor storms also reported at Boyds, Keedysville, Riviera Beach, and in Washington County, Md., in Fairmont, Berkeley Springs and Ripley, W. Va.
	11									Minor storm also reported at Falmouth, Ky.
	11									Minor storms also reported near Johnson and Nebraska City, Nebr.
	11									Minor storms also reported in southwestern and central Iowa.
	11									Minor storm also reported about 15 miles southeast to east of Pendleton, Oreg.
	11									Minor storms also reported at Topeka and near St. Marys, Kans.
	11									Minor storm also reported at Talledega, Ala.
	11									Minor storm also reported at South Bend, Ind.
Lindsborg (near), Kans.	12	6:30-7:30 a.m.	*2-3	5-6				80,000	Hail	Hailstones size of peas covered ground to depth of 2 or 3 inches and damaged corn and wheat.
Coffey County (northwestern portion), Kans.	12	9:30-10 a.m.	*1	3			2,000	4,000	do	Hailstones from size of walnuts to golf balls stripped wheat and corn.
Lanier County, Ga.	12	Afternoon							do	26 acres of mature tobacco destroyed, and corn damaged.
Eckley (4 miles east of), Yuma County, Colo.	12		*2	2				30,000	do	Hailstones to 1½ inches in diameter.
Otis (5 miles southeast of), Washington County, Colo.	12	3-3:15 p.m.	*2	5				20,000	do	Hailstones to 1 inch in diameter.
Stillwater (1½ miles south to 1/4 mile east of), Payne County, Okla.	12	3:50 p.m.	Narrow	Short	0	0	400	0	Tornado	1 farmstead damaged.
Orleans and Jefferson Parishes, La.	12	4:30-5 p.m.				1	25,000		Wind electrical, and hail	Squall line thunderstorm moved off Lake Pontchartrain over both parishes. 1 boat sank and several damaged when high winds struck regatta on lake. Home struck by lightning and burned. Hail reported in many sections in and near New Orleans.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Willmar and Farmington (vicinities of), Minn.	12	P.m.					$20,000		Thunderstorms and hail	A number of barns, outbuildings, homes, and town buildings damaged. Storm moved southeastward, accompanied by heavy hail in places.
Willmar and Farmington (vicinities of), Minn.	12	P.m.				1	40,000	$25,000	Hail	Heavy hail that accompanied severe thunderstorms caused considerable damage to real property and growing crops. Some small pigs and many chickens perished. Hailstones numerous and covered ground entirely in some places. Some replanting of crops necessary. Some hailstones in Willmar area size of baseballs; while in Farmington area some size of golf balls. Greenhouses in Willmar area badly damaged, and some fields of grain and most garden truck total loss. Storm moved southeastward.
Southern Cheyenne, northern and eastern Sherman, and western Thomas Counties, Kans.	12	5-9 p.m.					5,000	300,000	do	Several strips of heavy hail. Stones mostly 1/4 inch to 1/2 inch diameter, but up to golf ball size in St. Francis.
Cambridge Junction (3 miles west of), Mich.	12	5:30 p.m.			0	0			Tornado	Barn demolished, apparently by tornado.
Syracuse and central portion of State, N.Y.	12	Early evening			2		°500,000		Wind, hail, rain, and electrical	In Syracuse wind speeds reached 56 m.p.h. 160 blown-down trees reported. Power lines throughout city and central New York downed and some 15,000 telephones out of service. 2 persons drowned in Oneida Lake when their boat capsized by wind. Grain and hay lodged by wind and rain. Lightning burned barn at Henrietta, with estimated loss of $10,000.
Sandy Lake area, Pa.	12	Evening				1			Electrical	Lightning struck and burned barn and contents, estimated loss $35,000; set fire to oil tank and piles of lumber; stunned farm man.
Erie, Crawford, and Warren Counties, Pa.	12	8-11 p.m.				1			Winds, electrical, hail	Thunderstorms caused widespread damage to trees, wires, and other property, total estimated at tens of thousands of dollars. Lightning killed 6 cows. Streets and highways littered and blocked by debris. In Erie area, 2500 phones out of service, and 300 homes without power for over 10 hours. Spotty hail near North East damaged some grapes, cherries, and gardens.
Larned (north of), Kans.	12	8:55 p.m.			0	0	0	0	Tornado	Funnel cloud reported by 1 witness as reaching ground in open country.
Lake County, Ohio	12	9 p.m.					°10,000		Hail and wind	Most damage to greenhouses, at Painesville in particular. Hail to tennis-ball size. Utility service disrupted by 60 m.p.h. wind.
Keating Summit, Pa.	12	10:20-10:30 p.m.	200	**300	0	0			Tornado	Very local tornado milled around briefly in valley, then disappeared to northeast when it reached hilltop. Demolished 1 house and garage, moved others on their foundations, and damaged at least 1 barn and several other houses. Nearly pulled man out of window. Roof and siding shingles ripped off and scattered. Loudly shrieking winds. Trees uprooted, twisted, and felled.
Linkville and vicinity, Marshall County, Ind.	12	Night				2	6,000		Wind	Wind destroyed store, inflicting slight injury to 2 occupants. Only a short distance away barn blown down on an automobile which was heavily damaged by falling concrete blocks, etc.
South Bend (8 miles southeast of), St. Joseph County, Ind.	12				0	0	1,000	0	Tornado and rain	Wind picked up crib in which 5 persons had sought shelter from rain and carried it 500 feet with its occupants.
	12									Minor storm also reported in southeastern Lower Michigan.
	12									Minor storm also reported in Harrison County, Miss.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
	12									Minor storm also reported at Hamilton, Mont.
	12									Minor storm also reported in Wapello County, Iowa.
	12									Minor storms also reported near Great Bend and Fall River, Kans.
	12									Minor storm also reported at La Grange, Ind.
Berwick area, Pa.	13	Midnight-12:30 a.m.					$100,000		Electrical and winds	Foundryville and Derrs communities hardest hit. Two 2-car garages collapsed, damaging 4 vehicles inside them. Barn roof lifted and slammed into a parked car. Severe tree and wire damage, power out for up to 8 hours, and streets blocked by debris. At least 3 other barns, 2 houses, plane hangar, 2 garages, and numbers of sheds suffered major damage. These 2 communities estimated damage at $50,000. Elsewhere in area at least 3 other barns blown over or demolished, 4 cows and several hogs killed, 3 tractors and truck damaged, and greenhouse demolished. At least 2500 users without power; additional extensive tree and wire damage reported. Lightning damage minor compared to wind damage.
Hazleton-Scranton areas, Pa.	13	Midnight-12:30 a.m.							Electrical, winds, and rain	In Hazleton area, winds damaged awnings, trees, wires, and gardens and blocked streets with debris. TV antennas and at least 1 chimney damaged. Near Daleville, winds felled trees. These winds seemed to strike only a ½-mile wide straight path. In Scranton, lightning scored 10 hits but relatively minor damage. Winds felled at least 50 trees, damaged 1 house, and partly unroofed school. Heavy rains, ½-inch in 10 minutes, caused severe washing on hillsides, buckled pavement, and popped manhole covers. Near Falls, tree and wire damage extensive, 2 houses unroofed, 1 lost front porch, 1 had all windows blown in, 7 small farm buildings demolished, and 100 chickens killed.
Sunbury-Watsontown areas, Pa.	13	Midnight-1 a.m.				2			Electrical and winds	Lightning struck 3 houses and injured 2 people in Sunbury-Shamokin area; some wind damage to trees and wires. In Allenwood-Watsontown area, at least 3 barn roofs and 2 houses damaged by wind or by trees falling against them. Winds estimated at 60 m.p.h. In Hughesville area, wind damage to fair grounds and other property estimated at $10,000. Roof and tree damage in Lairdsville-Unityville-Benton area estimated at $50,000.
Mayaguez, P. R.	13-14	All day					86,000		Rain	Yaguez River, which crosses city of Mayaguez from east to west, flooded on account of heavy to excessive rains.
Platte Center, Nebr.	13	A.m.			0	0	0	$0	Tornado	Funnel cloud observed, but did not reach ground.
Brussett (4 miles west of), Garfield County, Mont.	13	12:30-1 p.m.	*8	10-15			1,000	10,000	Hail	
Sandy Cross Community, Oglethorpe County, Ga.	13	Afternoon							Wind and hail	4 farm buildings wrecked and trees fell on 2 automobiles. Some crop damage by hail.
Ohio, extreme southern and southwestern portions	13	Afternoon				4	°109,000		Rain, hail, and electrical	3 inches of rain and hail to golf-ball size in Ironton; 2.17 inches of rain in Cincinnati. Basements flooded. Heavy toll in lightning strikes on residences. Severe tree, foliage, and crop damage.
North Oakota, central portion	13	Afternoon and evening			0	0	10,000		Wind, rain, and tornado (possible)	Heavy rains in northern Sheridan County washed roads and some culverts and damaged crops. High winds and possible tornado struck Ryder, New Rockford, south of Wishek, south of Martin, and Belden in Mountrail County, destroying 1 large barn and damaging numerous farm buildings and small buildings in towns. 400 turkeys killed in Stanton-Hazen area.
Northern Billings, southern Mc Kenzie, through Dunn, and into Mercer Counties, N. Dak.	13								Hail	Much damage done by series of hailstorms.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Economy Community (near Atkins), Pope County, Ark.	13	Afternoon					$10,000		Wind	2 barns demolished; several other buildings damaged.
Black Oak and vicinity, Craighead County, to Bayou and Kaiser, Mississippi County, Ark.	13	2-2:30 p.m.			0	0	14,000	$20,000	Wind, hail, and tornado	2 houses and several buildings damaged east of Black Oak. Hail caused extensive damage to several farms in area. Hail 1 to 1½ inches in diameter. Tornado struck in vicinity of Sandy Bayou and Kaiser, Mississippi County, where 4 barns damaged and grain bin carried some distance; tornado path 880 yards wide and 2½ miles long. Damage by wind estimated at $5,000; by tornado, $4,000; by hail, $5,000 to property and $20,000 to wheat, oats, cotton, and soybeans.
McCook (north of), Nebr.	13	3 p.m.	Narrow	1	0	0	500	0	Wind (possible tornado)	
Trenton and vicinity, Nebr.	13	3:30-3:45 p.m.		Short	0	0	8,000	Some	Tornado and hail	Grandstand roof destroyed by tornado. Hail damage on 4 or 5 farms.
Tri-City Airport (Bristol), Sullivan County, Tenn.	13	4-5:15 p.m.							Wind and rain	Heavy thunderstorm, with wind gusts reaching 80 m.p.h. and 3.10 inches of rain in 1 hour. Considerable damage to young crops by washing rains.
Johnson City, Washington County, Tenn.	13	4:30 p.m.			1	3	12,000		Electrical	4 golfers struck by lightning, but not seriously injured. Church in Boone's Creek Community struck by lightning and burned, killing 1 person. Many power and telephone lines blown down.
Indianapolis, Marion County, Ind.	13	4:30 p.m.			0	0	600	0	Tornado, wind, and electrical	Storm described as "freak twister" picked up a hen house and deposited it in tree. Power lines damaged by lightning in at least 4 places.
Kentucky, central and northeastern portions	13	P.m.				1	50,000	25,000	Electrical, rain, hail, and wind	Heavy thunderstorms caused extensive damage to utilities, with heavy rain and some hail producing considerable crop damage and local flooding. Greatest damage in Jefferson, Fayette, Mason and Boyd Counties. Injury to man blown through plate-glass window at Simpsonville, Shelby County.
Between Lodge Grass and Wyola, Big Horn County, Mont.	13	5-6 p.m.	*2				Some	75,000	Hail	Damage to wheat, hay, and oats.
Bluefield, W. Va.	13	6-8 p.m.							do	Hail damage to crops.
Romney, W. Va.	13								do	Damage to orchards.
Berkeley Springs, W. Va.	13								do	Damage to orchards.
Boone County (southwestern portion), Nebr.	13	8-8:30 p.m.			0	0	500	0	Wind (possible tornado)	Brooder house wrecked.
	13									Minor storm also reported in Youngstown area, Ohio.
	13									Minor storms also reported in Henderson, Durham, and Person Counties, N. C.
	13									Minor storms also reported near Lansdale, Norristown, Bellefonte, Blossburg, and Lederach, Pa.
	13									Minor storm also reported at Shelton, Conn.
	13									Minor storm also reported near Downey, Idaho.
	13									Minor storm also reported at Artesia, N. Mex.
	13									Minor storms also reported at Thomas and Fairmont, W. Va., at Warrenton, Va., in Selbyville and in Sussex County, Del., in Princess Anne, Hampstead, Blackwater Refuge and in Washington County, Md.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
	13									Minor storms also reported near Elgin, Ewing, Wauneta, and Comstock, Nebr.
	13									Minor storm also reported at Princeton, Ind.
	13									Minor storms also reported in Jasper, Mahaska, and Clinton Counties, Iowa.
Barrett (vicinity of), Grant County, Minn.	14	A.m.					$1,000	$24,000	Hail	Light to heavy hail accompanied severe thunderstorm.
North Dakota, eastern portion	14	Day			0	0	25,000		Wind, electrical, rains, and possible tornado	Flash flood in northern Nelson County washed out approaches to 7 bridges and washed car off road and 1/4 mile downstream, damaging it beyond repair. Lightning destroyed elevator at Barney in Richland County. Tornado reported from 6 miles to 2 miles southwest of Lucca in Barnes County at 1:58 p.m. Very thin point touching ground. No reports of damage. At Enderlin hangar on farm wrecked.
Big Spring, Howard County, Tex.	14								Wind	Blew away barns. Destroyed cotton crops.
Waukesha, Wis.	14	Noon				1			Electrical	Bolt of lightning struck and injured 5-year old boy playing in back yard.
Rutland and Bennington County, Vt., Berkshire County, Mass., and extreme northern Litchfield County, Conn.	14-15	Afternoon, 14th morning, 15th					°100,000		Winds, rain, hail, and electrical	Most damage at Rutland, Poultney, Wells, Fairfield, and Ludlow, Vt.; Richmond, West Stockbridge, Lanesboro, and New Ashford, Mass.; and Canaan, Conn. Trees and utility lines downed by wind. Minor floodings and minor washouts from rain. Farms and orchards soaked and riddled by hail. Barn at Shaftsbury, Vt., burned down by lightning-set fire, $5,000 loss. Silo blown down at Fairfield, Vt. Fruit orchards in Rutland, Vt., and West Stockbridge areas 10 to 100 percent hail damage.
Canton, Ga.	14	Afternoon					Considerable		Electrical	Several places in town struck by lightning. Considerable damage to school building.
Waynoka (12 miles north of), Woods County, Okla.	14	Afternoon and evening			0	0	1,500	0	Wind and tornado	Tornado funnel closely observed moving in northeasterly direction. Damage by wind.
Banner County, Nebr.	14	1:30-3 p.m.	*2	10			5,000	195,000	Hail and wind	Stones ½ to 3/4 inches in diameter covered ground 1 to 4 inches deep. Strong wind increased hail damage to grain.
Medicine Lodge (3 miles southeast of), Barber County, Kans.	14	1:30 p.m.	440	2	0	0	250	0	Tornado and rain	Sheds on 1 farm damaged during heavy rain. Funnel reported seen by person living 6 miles northeast. Moved northeastward.
Sidney (southwest of), Cheyenne County, Nebr.	14	2-2:30 p.m.	*1½-2	4			Light	60,000	Hail	Stones ½ to 1 inch in diameter; depth on ground, 2 to 4 inches.
Box Butte County, Nebr.	14	Late afternoon	*2	8			Minor	500,000	do	Heavy crop of winter wheat destroyed.
East-central Russel to west-central Lincoln Counties, Kans.	14	2:45 p.m.	880		0	0	4,000	2,500	Tornado and hail	Funnel shaped cloud observed 6 miles north of Dorrance, moving northeastward. Several farms received building damage from this location northeastward into Lincoln County. Hail stripped wheat locally. Property damage by tornado; crop damage by hail.
Elrosa (near), Stearns County, Minn.	14	3:45 p.m.	Narrow	4	0	0	55,000		Tornado (possible), rains, and hail	All major damage apparently on 3 farms; on 1 of these all buildings, except house, demolished. Pump pulled out of well. Funnel-shaped cloud observed moving north-northwestward. Winds described as rotary, with uprooted trees lying in all directions. Heavy rains and some hail accompanied storm. Considerable minor damage outside narrow path of great destruction.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Transylvania and Buncombe Counties, N. C.	14	4 p.m.			1	3	$1,000		Electrical	Boy killed and 3 others injured by lightning at Cedar Mountain.
Union Mills, LaPorte County, Ind.	14	4 p.m.					12,000		do	14 head of registered cattle killed outright by bolt of lightning and 9 others so severely injured they had to be destroyed. Cattle had sought shelter from thunderstorm in grove.
Remington, Jasper County, Ind.	14	P.m.			0	0	500		Tornado	Wind blew trees down on electrical lines. Funnel cloud touched ground briefly a few miles north of Remington
Fleming (8 miles south-southeast of), Logan County, Colo.	14	4:30-5:30 p.m.	*2	5			4,000	$25,000	Hail	Hailstones to 3/4 inch in diameter.
Hays (17 miles northeast of), Kans.	14	5 p.m.	*1	3				20,000	do	Wind driven hailstones about 1/2 inch in diameter caused about 50 percent loss to wheat in 3 sections of land.
Lenoir, Lee, and Cumberland Counties, N. C.	14	Evening						33,650	do	Damage to tobacco in Woodington, Pink Hill, Greenwood, Vance, and Carvers Creek communities.
Columbia County, N. Y.	14	Evening					°200,000		Wind and hail	High winds and hailstones up to golf-ball size swept through orchards with widespread damage. Damage ranged from 2 to 100 percent of 1954 crop. Many chickens killed by hail, 2,000 at Canaan valued at $2,500.
Harper (east of), Harper County, Kans.	14	7 p.m.	*1	4	0	0	2,500	1,000	Hail and tornado	2 points of severe wind or tornado. (1) 5 to 7 miles southeast of Harper where several farmsteads hit and trees uprooted along 4 to 5 mile path. (2) 3 miles east of Anthony where barn wrecked and other buildings damaged on farm. Hail damaged wheat and oats in first area. Property damage by tornado; Crop damage by hail. Storm moved northeastward.
Luck, Wis.	14	7-7:30 p.m.							Hail and rain	Menacing black clouds came from west, bringing heavy shower and large hail, no strong winds however. Hail size of ice cubes with some stones 2½ inches in diameter. 178 panes of glass broken in local greenhouse. Fins on large exhaust fan in depot badly damaged also.
Appleton and vicinity, Minn.	14	8 p.m.					10,000		Thunderstorm	Portion of grandstand at Appleton Fair Grounds unroofed and small buildings nearby demolished or damaged. Poles and wires downed. Trees uprooted. Storm moved northeastward.
LaPlata, Mo.	14	9 p.m.	Narrow	Short	0	0			Tornado	Funnel cloud observed. Small tornado crossed Santa Fe picnic grounds; bathhouse moved 4 feet; automobile lifted off ground; other minor damage.
Leedy (northwest of), Dewey County, Okla.	14-15	10:30 p.m. -3 a.m.						20,000	Hail	Crops on several farms damaged.
	14									Minor storms also reported in Carroll and Saline Counties, Mo.
	14									Minor storm also reported in East Baton Rouge Parish, La.
	14									Minor storm also reported at Geneseo, Kans.
	14									Minor storms also reported in central and northern Kentucky.
	14									Minor storm also reported in Lenoir County, N. C.
	14									Minor storms also reported at Evansville, Idaville, Muncie, and Sheridan, Ind.
Monroeville (near), Allen County, Ind.	15				1				Electrical	Man killed by lightning as he worked in field.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Birmingham, Ala.	15	Noon			1				Electrical	Boy killed when lightning struck nearby tree.
Southern Ellsworth County, Kans.	15	12:30 p.m.			0	0	$0	$0	Tornado clouds	Several funnels reported seen. One from northeast of Claflin to south of Kanopolis Dam where it dipped in pastures. Others viewed to south of Ellsworth. No definite number given.
Illinois, central and northeastern portions	15	Afternoon							Wind	Numerous local windsqualls, the most severe of which damaged 3 farms in vicinity of Naperville, west of Chicago. In Chicago area wind damage was estimated at $2,500, while in Kankakee damages estimated at $19,000. In Springfield a building demolished. Near Pekin a plane overturned. Damage also reported in vicinities of Decatur, Belleville, and Ursa.
Greenville, Pa.	15	Afternoon					30,000		Electrical	Lightning fired barn, with complete loss.
Kittanning, Pa.	15	Afternoon				1	12,500		do	Lightning fire destroyed barn and contents.
Pittsburgh-Latrobe areas, Pa.	15	Afternoon and evening							Winds, electrical, and rain	Series of thunderstorms with locally heavy rain flooded basements and some first floors with water and silt, washed hillsides, and cluttered streets with debris. Gusty winds caused spotty tree and wire damage. Lightning caused much minor damage to houses and trees; in Latrobe it burned out 150 street light bulbs. At New Alexandria, gales snapped high voltage lines.
Napier, Mo.	15	1 p.m.	Very narrow	Short	0	0			Tornado	Funnel cloud seen by several persons. Pumphouse unroofed; other very minor damage.
Spangle, Wash.	15	1:30 p.m.	100	½	0	0	6,000	0	Wind (possible tornado)	1 barn leveled, roof blown from other buildings, and trees damaged in narrow strip. Storm lasted about 30 seconds.
Ohio, Northern half	15	Afternoon and night			2	1	139,000	Minor	Wind, rain, and electrical	1 person died of heat exhaustion prior to storm. 1 home destroyed by fire. Principal damage due to lightning, minor damage by flooding. 1 cow killed
Saginaw Bay area, Mich.	15	Afternoon							Wind	High winds flattened barn worth about $10,000 near Duel. Severe thunderstorms caused miscellaneous damage at Midland and Bay City.
Iowa, central portion	15	3-6 p.m.					27,000		Wind and rain	Damaged buildings, utility lines, and cars, and caused some flooding.
South Lyon, Mich.	15	5-6 p.m.							Hail	Severe hail, with stones of golf ball size, strippe farm of its crops, injured stock, and damaged buildings.
Lansing, Mich.	15	3:40 p.m.					31,500		Wind	High winds blew down garage, lumber yard shed, and wall of school under construction.
Southeastern Lower Michigan	15	Late afternoon			1				Electrical	Farmer killed when lightning struck his tractor near Otisville. Building and machinery destroyed by fire, resulting from lightning at Eaton Rapids. Home damaged and 2 barns burned near Middleville, with total loss of $11,500 from lightning strikes. At Marshall power plant, lightning damaged generators, estimated loss $15,000.
Washington and vicinity, D. C.	15	4-6 p.m.				1	10,000	Minor	Electrical and wind	
Richmond and vicinity, Va.	15	P.m.					25,000	Minor	Electrical	Barn destroyed by lightning, $20,000 damage.
Romney, W. Va.	15								Hail	Damage to orchards.
Cambridge, Md.	15	P.m.			1		Minor		Electrical	Lightning killed man.
Milwaukee, Wis.	15	P.m.				2			do	2 men struck by lightning; 1 was watching TV in his home, lightning struck TV antenna and rode into room damaging TV set and knocking viewer to floor. Minor damage throughout city, as trees and electrical lines blown down. Some hail fell, diameter 1/4 inch.
Colwich (6 miles southwest of), Sedgwick County, Kans.	15	4:30 p.m.			0	0	0	0	Tornado cloud	Funnel reported by 4 persons to Wichita Weather Bureau office, then observed for 4 minutes by Weather Bureau personnel to west-northwest of station.

See footnotes at end of table

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Emporia, Kans.	15	5:30 p.m.	1320	8			$3,000	$35,000	Hail and wind	Hailstones up to 2 inches in diameter driven by wind damaged grains southeast of town and gardens and buildings in town. (Unconfirmed report of funnel cloud just before hail fell).
Tecumseh (north of), Nebr.	15	Early Evening			0	0	1,000	0	Wind (possible tornado)	Set of farm buildings damaged. Many trees in town broken.
Gage County (southeastern portion), Nebr.	15	Evening	*1	1				22,000	Hail	
Suwannee County, (northeastern section), Fla.	15	Evening					4,000	Considerable	Electrical, hail, and wind	Hail damaged tobacco considerably and wind wrecked poultry houses. Tobacco barn burned as result of lightning strike.
Robeson, Yancey, and Forsyth Counties, N.C.	15	6:15 p.m.			1			2,575	Electrical and hail	Woman killed by lightning, while working in field near Lumberton. Crop damage in Kernersville, Brush Creek, and Prices Creek communities.
	15									Minor storm also reported near Sterling, Nebr.
	15									Minor storms also reported in Emmitsburg and Hyattsville, Md.
	15									Minor storm also reported in Kelliher and vicinity, Minn.
	15									Minor storm also reported in Traverse City, Mich.
	15									Minor storm also reported at Dubois, Pa.
	15-16									Minor storm also reported at Philadelphia, Pa.
	15									Minor storms also reported in Muscatine, Louisa, and Henry Counties, Iowa.
	15									Minor storm also reported in central Kentucky.
Crabtree Community, Haywood County, N. C.	16	Noon				1			Electrical	Man knocked unconscious by lightning, while shearing sheep.
Elgin (20 miles south of), N. Dak.	16	1 p.m.			0	0	0	0	Tornado	Funnel seen moving northeastward.
Bakerstown Community, Guilford County, N. C.	16	1:30 p.m.	100	5	0	1	5,000	0	do	Cement block structure destroyed and many roofs damaged; injured woman was in destroyed house.
Michigan, southern portion	16	Afternoon							Wind and electrical	Severe thunderstorms caused minor damage in Bay City, Battle Creek, and Coral. Barn struck by lightning and burned to ground at Cass City.
Ohio, north-central and central portions	16	Afternoon and evening				1	28,000	500,000	Rain, wind, and electrical	4.19 inches of rain near Celeryville, Huron County, flooded many acres of truck farms. Farm buildings and contents destroyed by fire. Oats damaged. Street section washed out.
Buffalo area, N.Y.	16	Afternoon			1	7			Electrical	Man killed by lightning in Tonawanda while 7 school children struck and burned slightly by lightning at Grand Island.
Bridgeville-Coraopolis areas, Pa.	16	Afternoon							Rain	Flood damage from heavy rains estimated about $35,000. Water reached depth of about 5 feet in some roads, inundated basements, stalled traffic. 30 families routed from homes in South Fayette Township. 30 autos in parking lot mired in 3 feet of water. Several gas lines separated by force of flood waters.
Waynesburg area, Pa.	16	2:30-3:30 p.m.				1			Rain and electrical	Local heavy thunderstorms sent several small creeks out of their banks, flooded a number of basements, poured water and silt on first floors of 4 homes. Small farm dam gave way. Fields badly washed, crops lost. Youth knocked unconscious by lightning.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Bay and vicinity, Craighead County, and Double Bridges and Luxora, Mississippi County, Ark.	16	2:30-3 p.m.	*3	30			$27,500	$290,000	Hail, wind, and electrical	In Craighead County $250,000 hail damage to cotton, corn, and some soybeans. In Mississippi County, $7,500 electrical damage; Wind damage of $20,000 to several barns unroofed; hail damage of $40,000 in spotted area covering about 10 sections. Hail ½ to 1 inch in diameter.
Fairmont, W. Va.	16							Minor	Thunderstorm	Heavy rain and miscellaneous damage into thousands.
Weirton, W. Va.	16	P.m.							Rain	Flooding damage.
Bass Lake, Starke County, Ind.	16	P.m.			1				Electrical	2 fishing companions thrown in water from boat.
Manley's Chapel (9 miles southeast of Paris), Henry County, Tenn.	16	4:15 p.m.					Slight	10,000	Thunderstorm and rain	Several hundred acres of corn and cotton destroyed by sudden downpour.
Corbin, Ky.	16	P.m.					10,000	2,000	Electrical, rain, wind, and hail	Chief damage to homes and business establishments due to flooding. Crop damage by hail.
Bell County, Ky.	16	5 p.m.				1	1,600	900	Electrical and hail	Barn and contents destroyed by fire after lightning strike; 1 mule killed.
South Bend and vicinity, St. Joseph County, Ind.	16-17	6 p.m.-2 a.m.					10,000		Electrical	Lightning started a number of fires and damaged a large smokestack.
Elwood to east of Ragan, Nebr.	16	6-7:30 p.m.	*2-5	35			5,000	25,000	Hail	Stones up to size of baseballs.
Cozad (8 miles south-southwest of), Nebr.	16	6:15-7 p.m.	Narrow	3	0	0	500	3,500	Hail and tornado	Garage destroyed; pick-up truck inside undamaged by tornado. Crop damage by hail.
Carson (near), Grant County, N. Dak.	16								Hail	Stones as large as hens' eggs.
	16									Minor storm also reported near Alma, Nebr.
	16									Minor storm also reported at Tetonia Experiment Station, Idaho.
	16									Minor storms also reported in Forsyth and Moore Counties, N. C.
	16									Minor storms also reported near New Carlisle and Bedford, Ind.
	16									Minor storm also reported in Puget Sound area from Tacoma to Everett, Wash.
	16									Minor storms also reported in extreme southern portion of Minnesota.
	16									Minor storm also reported at New Canton, Va.
Muncie, Delaware County, Ind.	17	Afternoon			0	0	200,000	0	Tornado and rain	Roof ripped from warehouse, greater part of damage due to rains washing through stored commodities. Many homes and business buildings damaged. Falling trees cut off electric power.
Kingsbury and vicinity, La-Porte County, Ind.	17	4 p.m.						100,000	Wind	Damage to corn and soybeans. Damage also to trees and TV aerials. Crops damaged over 5-mile swath through parts of Washington township.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Franklin, Simpson County, Ky.	17	P.m.					$10,000		Electrical and wind	Chief damage by wind. Utilities disrupted, TV antennas destroyed, 1 barn blown down, and extensive damage to industrial concern.
Columbus, Ohio	17	Evening					°10,800		Hail and wind	Price Field aircraft damage over $9,000. Considerable tree and foliage damage.
Banner County (southeastern portion), Nebr.	17	7-8 p.m.	*2-4	20			1,000	$50,000	Hail	Stones 3/4 to 2 inches in diameter.
North of Pilger to west of Pender, Nebr.	17	7-8:30 p.m.	Narrow	16	1	1	75,000	Light	Tornado	10 sets of farm buildings, 1 church, and 1 school destroyed or badly damaged.
Minnesota, southern portion	17	7 p.m.					80,000	70,000	Hail	Moderate to heavy hail accompanied severe thunderstorms. Some hailstones reported to be 2 inches in diameter. Storm moved eastward.
St. Cloud and vicinity, Minn.	17	7:20-7:40 p.m.	*5	7		4	1,000,000		Hail, rains, and wind	Most damaging hailstorm of record for St. Cloud occurred over area of some 25 square miles. In St. Cloud, very few buildings from Main Street southward escaped damage. Numerous windows broken, roofs and sidings damaged, hoods of automobiles dented, paint stripped from cars, many neon signs destroyed, and other miscellaneous damage. Greenhouses heavily damaged, with 2 having 100 percent glass loss and others in city ranged from 50 to 80 percent glass loss. Exceptionally large hailstones and jagged chunks of ice fell, largest measured 4 1/4 inches long and averaged 2½ inches in thickness. Hailstones accumulated on ground to depth of several inches. Many birds killed, trees stripped of leaves, and growing crops damaged. Storm moved eastward and was accompanied by heavy rains and high winds which resulted in considerable additional damage.
Minnesota, central and southern portions	17	P.m.			1		20,000		Electrical	Switchman struck by lightning and killed at St. Paul. Barn and silo near Little Falls destroyed by fire. Some livestock perished and farm and city property damaged in Jackson and Ogilvie areas. Barn in St. Paul destroyed.
Paynesville, Princeton, Brunswick (vicinities of), Stearns, Sherburne, and Kanabec Counties, Minn.	17	7:45 p.m.					32,000		Thunderstorms	3 barns demolished. Trees uprooted. A number of livestock perished in collapse of barn. Several barns, houses, and outbuildings damaged.
Rush City (vicinity of), Minn.	17	8:15 p.m.	880	4	0	0	100,000		Tornado (possible)	12 barns and rural school demolished. Some livestock and much poultry perished. On farm 2½ miles northeast of Rush City, barn and all outbuildings wrecked and several 2 x 4 boards driven through wall of farm house. Poles and wires down. Considerable minor damage outside narrow path of great destruction. Storm moved northeastward.
Minnesota, east-central and southeast portions	17-18						25,000		Rains	Excessively heavy rains that accompanied severe thunderstorms flooded basements, streets, roads, highways, and farm lands. Rivers swollen to near flood stage and creeks overflowed their banks. Small conservation dam partly washed out on Grindstone River. Growing crops damaged and some drowned out. Number of country-road bridges washed out.
Box Butte County, Nebr.	17	9:15-10:45 p.m.	440	2			5,000		Hail	Stones ½ to 1½ inches in diameter. Damage in strips.
	17									Minor storms also reported near St. Paul and Farwell, Nebr.
	17									Minor storm also occurred near Milton Experimental Station, Fla.
	17									Minor storm also reported at Sumter, S. C.
	17									Minor storm also reported in Rome, Ga.
	17									Minor storm also reported at Demopolis, Ala.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons: Killed	Number of persons: Injured	Estimated damage: Property (exclusive of crops)	Estimated damage: Crops	Character of storm	Remarks
	17									Minor storm also reported at Peru, Ind.
Tyndall (7 miles southeast of), Bon Homme County, S. Dak.	18	3:55 a.m.		40	0	0	$40,000		Tornado	Same cloud formation with funnel cloud evidently forming, breaking up, and reforming as it moved northeastward from south of Tyndall in Bon Homme County to Beaver Lake, Yankton County, to northeast section of Yankton County. In Bon Homme County, 2 farms reported heavy damage. In 2 general locations in Yankton County, cottages on east bank of Beaver Lake as well as buildings on 5 farms badly damaged.
Utica (5 miles northeast of), Yankton County, S. Dak.	18	4:05 a.m.								
Mansfield (southwest of), Yankton County, S. Dak.	18	4:20 a.m.								
Irene (northeast of), Yankton County, S. Dak.	18	4:25 a.m.								
South Dakota, extreme southeastern section	18						100,000	1,500,000	Rain	Heavy rain in 6 extreme southeastern counties resulted in 32,000 acres being flooded with total los to about 6,000 acres. Flooding most severe in Cla County. Heavy rains up to unofficial 10 inches in area. James River overflowed its banks; also othe creeks and streams in area did considerable flooding.
Marion (2 miles southwest to 3 miles northwest of), Turner County, S. Dak.	18	4:40 a.m.	50	4	0	0			Tornado	3 eye witnesses to funnel cloud. At location 2 mile southwest of Marion, large barn and silo destroyed, with barn having been lifted over a post. To north, barn, plate-glass window in house, and grove of trees destroyed. To east, in Marion, wind uprooted trees, broke windows, and damaged such buildings as lumber yard sheds.
Marshfield and vicinity, Wis.	18	A.m.							Electrical	6 homes struck by lightning, with fires resulting. Several head of cattle killed by lightning.
Chippewa County, (southern portion), Wis.	18	A.m.					30,000	1,200	do	Thunderstorm moved eastward. Lightning struck and set fire to church and 24- x 96-foot barn, destroying both. In barn approximately 60 tons of hay.
Iona (vicinity of), Murray County, Minn.	18	A.m.					35,000		Thunderstorms	Section of baseball park grandstand wrecked. Some farm buildings moved from their foundations or otherwise damaged. Many trees uprooted. Automobiles damaged by falling trees.
Jackson (vicinity of), Jackson County, Minn.	18	A.m.						40,000	Hail	Light to heavy hail that accompanied severe thunderstorm caused considerable damage to growing crops in places. Some fields of soybeans total loss.
Lignumvitae Key, Fla.	18	Afternoon			0	0	0	0	Waterspouts	Just before sundown a heavy squall line 4 to 5 miles off shore and paralleling Florida Keys 15 to 18 miles developed 11 waterspouts visible simultaneously. At least 5 reached water.
Milwaukee and vicinity, Wis.	18	Afternoon				2			Electrical and rain	Severe thunderstorm with frequent lightning and rain. Boy stunned by lightning as he walked from caddy house to clubhouse under opened umbrella. Woman injured as bricks fell on her when chimney of her home hit by lightning. Many traffic tie-up as lightning caused power failures for trolley system. Approximately 10 homes struck by lightning with minor damage.
Park County, Colo.	18	6-7:30 p.m.	*2	18			10,000	5,000	Hail	Hailstones to 2 inches in diameter.
Hixton and vicinity, Wis.	18-19	6:30 p.m.	900	10	0	0	100,000		Tornado and rain	High winds lasted 8 minutes at Hixton. Tornado moved east-southeastward as it left Hixton. 6 barns destroyed as well as numerous other farm buildings. Small streams in immediate area floode with 1 highway bridge washed out.
Raymore, Wis.	18	10:30 p.m.				1			Electrical	Railroad conductor struck by lightning just as he left train to step on ground.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Kewanee County and Southern Door County, Wis.	18-19	P.m.-a.m.							Electrical	Thunderstorm moved eastward. Farm home near Montpelier struck and destroyed by lightning. Barn near Nasewaupee destroyed by fire as result of lightning. Numerous farmers reported cattle killed by lightning. Man knocked down by lightning, but not injured.
	18									Minor storms also reported in Osceola, Dickinson, Emmett, Cass, Bremer and Wayne Counties, Iowa
	18									Minor storm also reported in Chatfield and vicinity, Minn.
	18									Minor storm also reported in Scottsbluff and Box Butte Counties, Nebr.
Taft (3 miles north of), San Patricio County, Tex.	19	8 a.m.			0	0	$0	$0	Tornado	Pilot reported funnel cloud not touching ground.
Millersville (near), Wis.	19	9:45 a.m.					17,000		Electrical	Lightning destroyed 40- x 90-foot barn. Resulting fire also destroyed pig barn.
Iowa, west-central portion	19	throughout day				1	10,550		do	Destroyed houses and buildings, and injured 1 man.
Michigan, southern portion	19	Afternoon				3			do	Lightning killed 6 cattle at Thornville, 28 cattle at Lyons on 1 farm and 4 on another. 3 men injured by lightning at Hartford and barn burned to ground as result of lightning with loss of $9,000 at Grand Rapids. Severe thunderstorms caused minor damage at Owosso, Dowagiac, Plainwell, and Marysville.
Jackson, Mich.	19	Late afternoon			0	0			Tornado	Swept across Gillett's Lake, damaging several houses and cars.
Yuma, Yuma County, Colo.	19	3:30-7 p.m.	*7	7			1,500	1,500	Hail	Hailstones to 3/4 inches in diameter.
St. Joseph and Benton Harbor, Berrien County, Sister Lake, Van Buren County, and Dowagiac, Cass County, Mich.	19	4-7 p.m.				1			Wind, rain, hail, and electrical	Falling trees pulled down utility wires, and lightning strikes interrupted utility services. At Dowagiac, 1.16 inches of rain fell in 1 hour, causing numerous washouts of county roads. Falling trees damaged cottage and car at Magician Lake. Highway #152 in Sister Lake area clogged by trees. Benton Harbor police counted 37 trees lying across roads. 2 sailboats capsized off Benton Harbor in Lake Michigan. At about 7 p.m. ½-inch diameter hail fell for about 10 minutes at Dowagiac.
Kenosha, Wis.	19	P.m.			2	1			Electrical	2 men struck and killed by lightning as they stood against shelter on golf course. 1 man standing along shelter on opposite side injured.
Minnesota, southwestern portion	19	P.m.					25,000	50,000	Hail and rains	Moderate to heavy hail accompanied severe thunderstorms, mainly in vicinity of Redwood Falls and Lakefield. Some hailstones as large as baseballs reported near Redwood Falls, where some livestock and much poultry perished. Heavy rains accompanied storm in Lakefield area.
Minnesota, southeastern portion	19	P.m.					100,000		Rains	Excessively heavy rains that accompanied severe thunderstorms flooded streets, basements, roads, and highways. Some bridges and culverts washed out. Lowlands inundated. Hay and growing crops damaged. Some small rivers and creeks overflowed their banks.
Minnesota, southern portion	19-20	P.m. and a.m.					40,000		Electrical	A number of places struck by lightning. Barn and small shed destroyed by fire in St. Paul. Lightning damage on 8 farms in vicinity of Austin; barn, silo, and 10 tons of hay entirely destroyed on 1 of these farms. Creamery in Windom damaged considerably.
Grover (10 miles northwest of), Weld County, Colo.	19	4:30 p.m.	*1	3			1,000	15,000	Hail	Hailstones to as large as baseballs.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Grover (10 miles west of), Weld County, Colo.	19	5 p.m.	10	**60	0	0	$50	$0	Tornado	Small tornado uprooted trees and damaged homes. Moved northeastward.
Rensselaer and Remington, Jasper County, Ind.	19	6:30-7:30 p.m.			0	0	°3,000		Tornado, hail, and rain	3 fields of corn, knee high, riddled by hail. Severe duststorm between Rensselaer and DeMotte preceded downpour. Several trees destroyed by tornado 10 miles north of Rensselaer. Hail size of marbles.
Harrisburg (3 miles south of), Lincoln County, S. Dak.	19	6:40 p.m.	50	3	0	0			Tornado	2 funnel clouds formed, then lifted, with a third forming immediately. The third reported to have touched ground, lifted, and touched again 1 mile distant to northeast. Buildings on 3 farms hit. Barns and sheds destroyed; minor damage to 2 houses Chickens and a calf killed. Reports indicate this formation extended northeastward across State line to Iowa, with funnel appearing again at Larchwood, Iowa.
Wauneta (east of), Nebr.	19	Evening			0	0	1,000	0	Wind (possible tornado)	10 large trees blown down, 1 onto house.
Lyon and Sioux Counties, Iowa	19	9 p.m.	880	3	0	0	10,000		Tornado	Destroyed buildings on 3 farmsteads.
	19									Minor storms also reported near Andover and St. Francis, Kans.
	19									Minor storms also reported in vicinities of La Cross Goshen, Plymouth, Michigan City, Hammond, and East Chicago, Ind.
	19									Minor storms also reported in Austin and Belle Plaine vicinities, Minn.
	19									Minor storm also reported in Osceola County, Iowa.
Mosinee (near), Wis.	20	2:40 a.m.			0	0			Tornado (possible)	3 barns damaged by strong winds in Kronenwether Township near Mosinee. 36- x 90-foot barn completely destroyed, including threshing machine and hay loader. 30- x 70-foot barn ½ mile east of barn described first blown over on new milk house. Top of silo near barn twisted off and deposited 200 feet away on ground. Just east of this farmstead, another barn had its west end blown in. Nearby corn crib picked up and deposited in pile about 40 feet east. Garage on this farmstead collapsed on family car. Storm moved eastward.
Brothertown (near), Wis.	20	A.m.			0	0			do	Barn and silo flattened. Some machinery in barn twisted and smashed. Crops in path of wind leading to barn flattened. 2 wagons of hay about 30 feet from barn untouched. Roar heard.
Langlade, Oconto, and Marinette Counties, Wis.	20	A.m.					Unknown		Electrical	At Antigo in Langlade County woodworking plant struck by lightning with fire damage to plant $20,000. Lightning set fire to small barn near Peshtigo, destroying it - loss $8,000. Near Coleman in Oconto County a 40- x 90-foot barn hit by lightning and destroyed by fire. Farm machinery valued at $20,000 also lost in fire. At Pulaski in Marinette County, power lines knocked down by lightning, killing 7 cattle. Total of 30 cattle reported killed by lightning in 3-county area.
Beaumont (20 miles northwest of), Jefferson County, Tex.	20	11:06 a.m.			0	0	0	0	Tornado	Funnel cloud not touching ground reported.
Tekamah (north of), Nebr.	20	Late afternoon			0	0	0	0	do	Cloud observed, but did not reach ground.
Arapahoe (south of), Nebr.	20	P.m.			0	0	1,500	0	Wind (possible tornado)	Cloud data unavailable. House damaged.
Illinois, central portion	20	4:30-6 p.m.			1		30,000		Wind, hail, electrical, and rain	Severe windsquall demolished 3 buildings on Logan County fairgrounds at Lincoln. Heavy hail fell over scattered areas, with damage to crops reported in vicinities of Middletown, Brocton, and Ogden. At Virginia 1 woman killed by lightning. Very heavy rains and some wind damage at Roanoke.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Arapahoe, Cheyenne County, Colo.	20	5:30-6:30 p.m.	*3½	10				$25,000	Hail	Heavy damage to wheat.
Tilden (near), Nebr.	20	6-10 p.m.	*3-4	25-30	0	0	$15,000	75-100,000	Hail and tornado	Stones golf to baseball size, some 6 inches long. Property damage mostly by tornado.
Grand Island, Nebr.	20	11 p.m.	Narrow	1	0	0	2,500	0	Tornado	Upper part of higher buildings damaged in business district, storm apparently did not descend completely to ground.
	20									Minor storm also reported near Norfolk, Nebr.
	20									Minor storm also reported at Grand Haven, Mich.
	20									Minor storms also reported in Sioux and Woodbury Counties and north-central Iowa.
Thumb area, Mich.	21	Afternoon				1			Electrical and wind	At White Lake near Whitehall, cottage struck by lightning and burned to ground with loss of $15,000. Severe thunderstorms caused minor damage at Pontiac, Marysville and at Bay City where a person injured by falling tree.
Big Lake (1 mile north of), Whitley County, Ind.	21	3 and 8 p.m.			0	0	2,000	0	Tornado, wind, and electrical	Small wooden silo smashed to bits. Barn moved approximately 4 inches off foundation by west wind; moments later wind shifted putting barn almost back in its original position; barn was broken loose from cement block cowshed. Most metal roofs on farm loosened; 1 chicken house moved. Door in house torn from hinges. Roof removed from hog house on nearby farm. Trees blown over on 3 other farms. Lightning struck and ruined speaker on TV set.
Glasco (3 miles east of), Cloud County, Kans.	21	4:05 p.m.	Narrow	4	0	0	3,000	6,000	Tornado, hail, and rain	Small tornado accompanied by heavy rain and hail. Hay barn destroyed, roofs ripped off, windmills down, trees toppled and others denuded of leaves. Wheat and other grain shattered. All damage figures from tornado. Hail maximum ½ inch in diameter. Storm moved eastward.
Iowa, Grant, and Lafayette Counties, Wis.	21	P.m.							Rain, wind, hail, and electrical	Storm moved eastward. Official rainfall at Dodgeville from 7 a.m., 21st to 7 a.m., 22d 6.06 inches. Unofficially, sheriff of Iowa County reported fall of 5.02 inches of rain in 2-hour period, 3:15 to 5 p.m., with 24-hour total of 6.50 inches. Churches and urban and rural buildings damaged by lightning strikes. Wind uprooted trees, blew off doors of building, blew over telephone and electric poles, and blew in windows. Small streams overflowed and flooded in many communities. Overflowing streams inundated hundreds of acres of corn and grain and also carried away thousands of tons of topsoil. Storm damage in town of Glen Haven, Grant County, estimated at $20,000. Area ½ mile long and approximately 500 yards wide stripped of corn and oats near Glen Haven.
Milwaukee, Wis.	21	6 p.m.			1				Electrical	Man struck and killed by lightning as he walked along sidewalk under tree.
Illinois, extreme northern portion	21	6-8 p.m.			1	10			Wind, rain, and electrical	Heavy wind- and rainstorm, especially in Pecatonica Basin. Damage to trees and power and communication lines in Durand, Rockford, and Belvidere. At Rockford 1 person drowned in Rock River when windsquall struck. Near Galena minor damage to farms; 1 cow killed by lightning. Near Reddick in Kankakee County 15 pigs killed by lightning, with loss of $1500.
	21									Minor storm also reported at Kendallville, Ind.
	21									Minor storm also reported at Madison, Wis.
	21-22									Minor storm also reported at Lewiston, N. Y.
	21									Minor storm also reported in eastern Iowa.
Peshtigo and vicinity, Wis.	22	11:15 a.m.					20,000		Hail	Hailstones as large as golf balls fell for 15 minutes as storm moved northeastward. Extensive damage to roofs, windows, and neon signs throughout city. Damage to corn and potato crop heavy just east of town, with minor damage to strawberries and tomatoes.
Sage, Izard County, Ark.	22						20,000		Electrical	Loss by fire to church struck by lightning.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons Killed	Number of persons Injured	Estimated damage Property (exclusive of crops)	Estimated damage Crops	Character of storm	Remarks
New York, central portion	22				2		°$450,000		Electrical and wind	Thunderstorms accompanied by strong winds. 1,220 telephones out of service, and 40,000 power customers affected by failures caused by line breakages. Many trees uprooted to damage automobiles. Lightning burned furniture store at Oneida with loss placed at $250,000.
All New England, especially Vermont	22-23	Afternoon, 22d-evening, 23d.			1	3	°150,000		Wind, rain, hail, and electrical	Widespread thunderstorms. Hingham, Mass., golfer killed and 3 others injured by lightning on afternoon of 23d. $4,000 lightning-set fire in St. Albans, Vt., among several losses of same type. Wind damage $10,000 in Caribou, Maine; numerous other wind losses. Crops flattened by wind and hail in many areas. Widespread utility damage.
Blairsville area, Pa.	22	6-7 p.m.							Electrical and rain	Lightning-set fire destroyed barn and contents. Local heavy rains flooded basements and damaged gardens.
Pittsburgh area, Pa.	22	Evening							do	Lightning strikes in scattered localities knocked out power and phone service, disabled a water pumping plant of Shaler Township. Heavy local rains temporarily flooded many sections, halted traffic, and caused land slides.
	22									Minor storms also reported at New Castle and Cambridge Springs, Pa.
Hammonton, Atlantic County, N. J.	23					1			Electrical	Man struck by lightning and killed while chopping down trees.
Stantonsburg, Wilson County, N. C.	23	Noon						200,000	Hail	
Miami (15 miles northwest of), Fla.	23	Afternoon			0	0	0	0	Tornado	Funnel existed under thunderstorm for 18 minutes an drifted slowly eastward. Reached surface in pasture.
Columbia County (south Portion), Fla.	23	Afternoon						25,000	Hail and wind	Damaged tobacco, corn, and watermelons.
Mitchell and Colquitt Counties, Ga.	23	Afternoon	*5	20				Considerable	Hail, wind, and rain	Easte⁻n Mitchell and northwestern Colquitt County. Considerable crop damage by wind and hail. Some property damage by flash flood in Pelham.
Chester, S. C.	23	Afternoon			0	0	°5,000		Thunderstorm and possible tornado	Storm evidence indicates possibility of limited tornadic action.
Wrightsville Beach, New Hanover County, N. C.	23	5:15 p.m.			0	0	60,000	0	Tornado	Tornado hit beach area, with skipping path. Main damage to 3-block area on northern end of beach.
Orange Park, Fla.	23	6 p.m.	*1	3	2	0	2,000	0	Wind (possible tornado)	Deaths occurred in house trailer demolished by falling tree. Roof damage to buildings; trees downed at scattered points.
	23									Minor storm also reported at Charlevoix, Mich.
	23									Minor storm also reported at Reading Pa.
Elkhart, northern Noble, and central LaGrange Counties, Ind.	24	P.m.					300,000		Wind	Described by newspaper as "cyclonic storm" of few minutes duration.
Northern Laramie County, Wyo.	24	5-6 p.m.	*8	35			1,000	75,000	Hail	Heavy damage to crops. Hailstones to 3/4 inch in diameter.
Tucson and vicinity, Ariz.	24	6:30 p.m.					16,000	0	Electrical and rain	Heavy rain accompanied thundershower, causing damage by flash flooding to several business and residential houses. Lightning damaged power and telephone lines. Damage by rain $15,000; by lightning $1,000.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Albin, Wyo. to Bridgeport, Nebr.	24	6:30-7 p.m.	*4-6	50			Minor	$250,000	Hail	Stones 1 inch in diameter accumulated on ground to 3 to 8 inches deep.
Miles City, Mont.	24	7 p.m.			0	0			Tornadoes and hail	2 funnels observed, both reached ground. 1 tornado 18 miles south of Miles City completely destroyed machine shed and took 500-bushel steel granary more than 1½ miles. Severe hail cut grain. Storm traveled southeastward. Second funnel west of Miles City.
St. Cloud and vicinity, Minn.	24	11:05-11:25 p.m.	*4	5			$250,000		Hail and rains	Severe hailstorm, second within week, occurred over north and west portions of St. Cloud. Northern limit extended to Sartell, 4 miles north of St. Cloud. Very large hailstones again observed, some exceeded 3 inches in diameter and nearly spherical in shape. Ground completely covered in places, with average depth less than 1 inch. Damage less extensive than in previous storm, as it occurred mainly over farm lands. Considerable damage to growing crops. Hail confined mostly to residential districts. Heavy rains accompanied storm which moved eastward and resulted in considerable additional damage.
	24									Minor storm also reported in Pitt County, N. C.
	24									Minor storm also reported near Dade City, Fla.
	24									Minor storm also reported in southeastern Upper, Mich.
Denmark Township and vicinity, Washington County, Minn.	25	4:15 a.m.	*1	3	0	0	25,000		Tornado (possible)	Home and barn demolished; barns on 2 other farms unroofed; home damaged by falling tree. Heavy steel clothes pole completely bent over. Storm moved eastward.
Grantsburg (near), Wis.	25	A.m.					35,000		Electrical and hail	Church struck by lightning, with fire burning church to ground. 1 farm home also set afire by lightning, damage minor. Some small hail observed.
Hilliard (near), Fla.	25	Afternoon				1			Electrical	Victim hospitalized, but recovered.
Victorville (8½ miles northeast of), San Bernardino County, Calif.	25	2-4:30 p.m.	*3	35	0	0	10,000	0	Tornado, wind, hail, and rain	A period of thunderstorm activity accompanied by strong winds, hail, and tornado resulted in damage to all frame houses, garages, and other buildings in Bell Mountain district. Hailstones ½ inch average size. Storm moved from Lucerne or Apple Valley districts in northerly to northwesterly direction through Bell Mountain toward Barstow. One observer reported the following: 4-bedroom home in path of large, black funnel-shaped cloud destroyed 8 miles northeast of Victorville. Roof blown off and walls loosened; windows broken; large picture window blown into living room, smashing furniture. Floors covered with water 3 inches deep; TV set, upholstered furniture, bedding, mattresses, clothing, etc., soaked. China cups and plates hanging on wall unmoved. Parts of roof 12 x 20 feet, some larger, blown 300 feet away; piece of 2 by 4 driven several feet into ground. Small shed covering pump and storage tank about 9 x 10 feet lifted off pump and deposited beside it. 2 chicken pens 10 x 12 feet destroyed, also fences; TV antenna, heavy 2½ inch pipe bent toward west.
Central Lower Michigan.	25-26	Night			1				Electrical and wind	In Van Buren Township, Wayne County, man burned to death in his home as result of lightning. In Saginaw area, several houses struck by lightning, causing minor damage. At Lansing, high winds tore off roof of lumber shed amounting to $10,000 damage. Severe thunderstorms at Pontiac, Davison, Flint, Alma, Armade, and Milford caused minor damage. At Sparta, 12 cows killed by lightning.
	25									Minor storm also reported near Minatare, Nebr.
	25									Minor storms also reported in Platte and Goshen Counties, Wyo.
	25									Minor storm also reported in Eloy and San Simon areas, Ariz.
	25									Minor storm also reported in Mecklenburg County, N. C.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Alliance, Nebr.	26	1 a.m.	Narrow		0	0	$4,000	$0	Wind (possible tornado	Passed into rather sparsely settled country.
Chicago, Ill.	26	Early morning			8			None	Wind	A seiche accompanied a brief heavy windsquall along Chicago Harbor, with water rising suddenly 3 to 8 feet, the greatest rise at Montrose Harbor. Fishermen swept off piers and swimmers out into Lake Michigan. Many rescued, but 8 lives lost.
Linn County, Iowa	26	9 a.m.					30,000		Hail	Damaged greenhouses, buildings, and automobiles. Stones of 3 inch diameter reported in some areas.
Mackay and vicinity, Idaho	26	Morning and early afternoon							Rain	Several bridges washed out and considerable damage to roads.
Ohio, northern and central portions	26	Late morning and early afternoon			0	3	°27,000		Wind, hail, and tornadoes	Line squall moved southeastward across State, with "miniature twister" at Zanesville which partially unroofed barn and damaged house. Small tornado 9 miles northeast of Columbus Airport. Hail to ½ inch in diameter in Hancock County. 2 men rescued from capsized boat on Scioto River. Considerable automobile, tree, and utility damage.
Stockbridge, Mich.	26					2	7,000		Electrical	Lightning damaged house and injured 2 persons.
Uniontown-Charleroi-Rogersville areas, Pa.	26	2-3 p.m.				1			Electrical and winds	Severe windstorms attended spotty thunderstorms. Lightning struck and stunned boy on bicycle. In Uniontown area, restaurant roof ripped off, shoved through utility lines and dropped again. Outdoor theater screen ripped and felled. Small farm buildings lifted into air and dropped. Scores of trees damaged or felled and utility service disrupted. In Charleroi area, lightning struck church steeple with estimated $2,000 damage. Lightning struck oil derrick with loss estimated at $4,000, and killed at least 1 cow. Stockdale and Roscoe had heavy wind damage to houses, roofs, windows, trees, and wires. At Rogersville, roofing torn from house, several barns toppled, one-half of concrete garage-apartment destroyed, and other farm buildings damaged as well as trees and utility lines.
Madison-Arona areas, Pa.	26	2:25 p.m.	65	Several	0	0			Tornado	Funnel-shaped cloud moved into Arona from southwest, smashed large barn, moved to lake where it uprooted scores of trees and tossed water around, then moved southward. It severely damaged house and pigeon coop, shoved parked cars around, hit and demolished brick school house, partly unroofed another house, took shingles off another barn and house, then ripped through woods where it destroyed 5 acres of trees. Last seen still headed southward. Power, phone and water services out for several hours following storm. Middle 2 house trailers of group of 4 overturned and badly damaged.
Waynesboro, Pa.	26	3 p.m.				2			Electrical	Lightning stunned 2 men; set fire to barn, with loss of barn, contents, and equipment.
Charles County, Md.	26	P.m.					100,000		Wind	
Eccleston, Baltimore County, Md.	26	P.m.					15,000		Electrical	Lightning burned barn with hay.
New Market, Va.	26	P.m.					75,000		Wind	Wind demolished large barn with chickens.
Clarksburg, W. Va.	26	P.m.							Thunderstorm	Miscellaneous damage.
Chester, W. Va.	26	P.m.			2		Minor		Electrical	Lightning killed 2 men.
Marshall County, W. Va.	26	P.m.					20,000	Minor	Rain, wind, and electrical	
Tappahannock, Va.	26	P.m.			0	0			Tornado	Reported in press as minor damage from minor twister.
Cumberland, Md.	26	P.m.						Minor	Wind	"Did more damage than had been witnessed here".

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Dover County, Del.	26	P.m.						Minor	Wind, rain, and electrical	
Washington vicinity, D. C.	26	Late p.m.			2	Several		Minor	do	2 drowned in storm sewer.
Bozeman, Mont.	26	6 p.m.					Considerable		Electrical	Main power distribution line burned.
Eminence and vicinity, Morgan County, Ind.	26	8 p.m.			0	0	$5,000	$0	Tornado	Blew roof off turkey house and barn; tore porch floor and railing from home; ripped corner from gymnasium. Many trees and mile of telephone poles downed. Roads also blocked by falling trees in southern portion of County. Storm lasted less than 2 minutes.
	26									Minor storms also reported at Fremont and from central DeKalb County to central Steuben County, Ind.
	26									Minor storms also reported at Philadelphia and Canonsburg, Pa.
	26									Minor storms also reported at the following places: W. Va. Elkins Upper Davisson Run Thomas Stony River Dam Rowlesburg Phillippi Moorefield Fairmont Berkeley Springs Arbovale Buchanan Romney Mathias Va. Fauquier County Richmond Culpeper Winchester West Point Warrenton Vienna Timberville Manassas Kerr Creek Fredericksburg Clarendon Charlottesville Chantilly Big Meadows Glenn Dale Luray Md. Southern Md. Frederick Williamsport Owings Ferry Landing Greensboro La Plata Frostburg Charlotte Hall Boyds Montgomery County Church Hill, Queen Annes County
New England, especially Maine, New Hampshire, and Massachusetts	27-28				1	1	°200,000		Wind, rain, hail, and electrical	Southward-moving line of thunderstorms swept northern States mainly on morning and afternoon of 27th; southern States comparatively little damaged during both days. Maine and New Hampshire hardest hit by wind, rain, hail, and lightning. Property and crop losses very numerous. Minor flash floods in Maine. Bradford, Mass., child electrocuted by storm-felled power line and Palermo, Maine, man injured by lightning.
Bannock and Oneida Counties, Idaho	27	10:30 a.m.-2 p.m.							Hail, wind, and rain	Beginning at 10:30 a.m. about one-half of Malad Valley hit by light hail (1/8 to 1/4 inch), with about $12,000 damage to peas, corn, wheat, and barley. At 2 p.m. wind and rain near McCammon damaged about 10 percent of grain and hay in fields over area 4 x 8 miles, one-half of which in summer fallow.
Martin, Beaufort, Pitt, Duplin, Dare, Bertie, Hertford, Nash, Wilson, Guilford, and Randolph Counties, N. C.	27	Afternoon					6,000	1,054,700	Hail	Damage to crops, mostly tobacco, on numerous farms in communities of Jamesville, Dardens, Angletown, Cooper Swamp, Griffins, Robersonville, Flat Swamp, Nags Head, Warsaw, Kenansville, Mitchells, Topps Cross, Ross, Bloody Cross Windsor, St. Johns, Drywells, Bailey, Greenville, Beaver Dam, Winterville, Chicod, Carolina, Oldfields, Taylors, Saratoga, High Point, and New Market.
Lee, Davidson, Chowan, Currituck, Washington, and Pamlico Counties, N.C.	27	Afternoon				2	10,000		Wind and electrical	In Sanford and Deep River areas, trees downed and barn unroofed. 2 persons injured by lightning in vicinity of Denton. At Cherry Point, Marine Base warehouses destroyed.
Washington, Beauford County, N. C.	27	3:12 p.m.			0	0	30,000	0	Tornado	Several warehouses and other business structures destroyed or badly damaged.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
North Dakota, southwestern portion	27	Early evening					$35,000		Wind and electrical	30 x 16 foot granary blown off high foundation 9 miles southeast of Gladstone. Other damage on same farm. Barn near Taylor struck by lightning and burned. Near and in Almont 1 large barn blown down, other buildings damaged, and cow killed by lightning. Bismarck-Mandan area hit, causing considerable damage with torrential rain which flooded many basements. Drive-in theater screen blown down, several plate-glass windows blown in, steel chimney and sign damaged, and warehouse roof partially blown off.
Millstadt, Ill.	27	3:20-3:30 p.m.							Wind	Severe windsquall. Extensive damage to trees; minor damage to buildings and other property.
	27									Minor storms also reported near Gordon and Clinton, Nebr.
Minnesota, central and extreme southern portions	28	A.m. and p.m.					50,000		Wind, rain, and hail	Thunderstorm moved northeastward. Sheep shed and metal grain storage building demolished; town and farm buildings damaged; trees uprooted; poles and wires down.
Minnesota, central and extreme southern portions	28	A.m. and p.m.						$15,000	Hail	Light to moderate hail accompanied severe thunderstorms.
Minneapolis, St. Paul and vicinities, Minn.	28						15,000		Electrical	Lightning struck church steeple and apartment house in St. Paul and several places in Minneapolis. Damage mostly minor, except to church where loss $11,000.
Homestead (near), Fla.	28	Afternoon			0	0	0	0	Tornado	Funnel cloud observed over water east of Homestead. Did not reach surface.
Quitman, Cleburne County, Ark.	28	Afternoon					3,000	5,000	Wind and hail	Hail ½ to 1½ inches in diameter. Property damaged by wind, crops by hail.
Missouri, central portion	28	2:30 p.m.					20,000		do	Local wind- and hailstorms, most severe of which damaged trees and buildings on 5 farms east and northeast of New Franklin. Minor damage reported in southern Callaway County. (Same evening freak storm pulled pump out of well at Revere in extreme northeastern Missouri.)
Stigler (6 miles east of), Haskell County, Okla.	28	6 p.m.	20	**50	0	0	2,500	0	Tornado	Damage to buildings on 1 farm.
	28									Minor storm also reported from La Dodson to Winnfield, Winn Parish, La.
	28									Minor storm also reported in Buena Vista and Palo Alto Counties, Iowa.
	28									Minor storm also reported at Russellville and vicinity, Ind.
Ruston area, Lincoln Parish, La.	29	10 a.m.					10,000	Slight	Electrical	Power and communications lines damaged. Radio station put out of commission. Lightning strike damaged college building and broke windows.
Arcadia vicinity, Bienville Parish, La.	29	10 a.m.					10,000	Slight	Wind	Demolished 1 home, damaged another and 2 barns.
Des Moines and Louisa Counties, Iowa	29	10 a.m. to 2 p.m.					50,200	100	Wind and electrical	Wind damaged school and other buildings. Lightning started fires
Boise City (10 to 15 miles north and northwest of), Cimarron County, Okla.	29				0	0	0	0	Tornadoes	Two tornado funnels observed.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Illinois, northern portion	29	1:30-5:15 p.m.			1	7	$250,000		Wind, rain, hail, and electrical	Series of windsqualls caused extensive damage to trees, power and communication lines. Most severe squalls damaged farms in vicinities of Milledgeville, Shannon, and German Valley in early afternoon, and damaged hotel, boats, and recreation facilities at Fox Lake in late afternoon. Damage also reported at Rockford, Belvidere, Dekalb, and Mendota. At Elgin heavy rains flooded streets. Some damage to crops from hail over widely scattered areas. Automobile accidents directly attributed to storms caused 1 death at Mascoatah, and 7 injuries near Ottawa and Kankakee. Near Good hope 2 barns struck by lightning and burned.
Stead (4 miles south of), N. Mex.	29	1:30 p.m.	300	4	0	0	0	$0	Tornado	Over open country; no damage.
Austin, Conway County, Ark.	29	Afternoon			1				Electrical	Man killed when lightning struck fence he was holding.
Paragould, Ark.	29	2:10-3:30 p.m.	Narrow	Short	0	0	8,500	0	Tornado and electrical	$8,000 of damage by tornado; $500 by lightning. Storm moved southeastward.
Willow Springs, Mo.	29	2:15 p.m.					25,000		Wind and hail	Damage mostly to roofs and glass. A total of 165 insurance claims made immediately following storm. Some damage to oats and wheat in vicinity.
Ellsworth (near), Wis.	29	3:30 p.m.	1700	6½	0	0	5,000		Tornado (possible)	Storm moved northeastward over Herbert Community, approximately 8 miles southeast of Ellsworth. A few small farm buildings knocked down and roofs of homes damaged.
Pine Island and Rochester (vicinities of), Minn.	29	4:20 p.m.			0	0	0	0	Tornadoes (possible)	Twin funnel-shaped clouds aloft sighted northwest of Pine Island by motorist. Single funnel-shaped cloud aloft observed by airplane pilot about 5 miles west of Rochester. While funnel-shaped cloud dipped twice, it did not touch ground, pilot reported.
	29									Minor storm also reported near Randolph, Minn.
	29									Minor storms also reported in Cerro Gordo, Black Hawk, and Fayette Counties, Iowa.
	29									Minor storm also reported in Jonesville area, La.
	29									Minor storm also reported near Live Oak, Fla.
Bullhead Township, Greene County, N.C.	30	12:30 p.m.						62,000	Hail	Damage to tobacco, corn, and cotton.
Loveland (southeast of), Larimer and Weld Counties, Colo.	30	2:10-3:30 p.m.	•6	15			25,000	75,000	Hail and rains	Crops destroyed. Heavy rain caused local flooding.
Spratt, Mich.	30	Late afternoon	1800	2			1,000	10,000	Hail and winds	Hail up to ½ inch in size pelted strawberry and wheat crops. Several buildings damaged by hail and high winds.
Tucson area, Ariz.	30	4:50 p.m.				3	5,000		Wind	High winds accompanied thunderstorm within 10-mile radius of Tucson. Winds reached 79 m.p.h. at CAA control tower. Considerable damage to roofs, and power and phone lines. Downed trees and blowing dust responsible for 3 injuries involved in in auto accidents (1 died of heart attack). Very little rain accompanied storm.
Hamilton County, Ohio	30	5 p.m.			0	0	°500		Tornado (possible)	Possible tornado. Many trees and wires downed, with general disruption of utility services.
Grand Junction, Mesa County, Colo.	30	6 p.m.			1	1			Electrical	Death and injury occurred at baseball game.
Olathe (2 miles southwest of), Kans.	30	6:30 p.m.	•2	4	0	0	500	5,000	Tornado and hail	Hail damage mostly to corn. Although tornado funnel not seen to touch ground, damage to outbuildings on several farms indicated tornadic action. Tornado path 1 mile long. Property damage: $500 from tornado crop damage: $5,000 from hail.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Ottawa (2 miles northeast of), Franklin County, Kans.	30	Evening							Hail	In local thunderstorm large hailstones stripped vegetation on at least 5 farms. Damage not estimated.
	30									Minor storm also reported in Willcox area, Ariz.
	30									Minor storm also reported at Philadelphia, Pa.
	30									Minor storm also reported in San Juan County, N. Mex
	30									Minor storm also reported in northern Audrain County, Mo.
	30									Minor storm also reported near Springdale, Ark.

* Miles instead of yards.
** Yards instead of miles.
° Crop damage included with other property damage.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS-Continued

JUNE 1954

Severe floods occurred during June in northern Iowa and southern Texas. These floods produced record to near-record stages in the Des Moines, Rock, Little Sioux, and Big Sioux River Basins in Iowa and the greatest flood of record in Rio Grande written history. Damages to growing crops were heavy in Iowa. Two lives were lost in the Iowa flood, while in Texas at least 16 lives were lost. On the Mexican side of the Rio Grande there was a considerably greater loss of life.

UPPER MISSISSIPPI AND MISSOURI BASINS

Floods in Iowa.--Excessive rains from the 17th through the 21st over north-central and northwestern Iowa produced record to near-record flooding in the Des Moines River Basin at and above Des Moines and in the Rock, Little Sioux, and Big Sioux River Basins.

These record flood-producing rains were preceded by wet weather during the last decade of May and during the week preceding the excessive rains. Minor flooding occurred on the Iowa, Middle, Little Sioux, and Lloyd Rivers in Iowa between the 10th and 12th. The surface soils over a large portion of the area were near saturation point while the subsoil was still dry as the rainfall had been deficient throughout the latter part of the preceding summer and autumn and snowfall had been light through the winter. The rainfall in April did not replenish the subsoil moisture.

A change in the synoptic pattern began the last week in May and continued until about June 21. The new pattern was composed of high pressure east of the Mississippi River, low pressure in the far southwest, mP and cP thrusts into the northern Great Plains and upper Mississippi Valley, with slowly progressing or retrograding fronts reaching from Lake Superior and Wisconsin down to east Colorado and New Mexico. Maritime air moved well over the Great Plains, and showers and thunderstorms developed over wide areas.

The front separating the warm moist Gulf air and the dry cool air became stationary on the 18th and for the next 4 days one heavy shower after another was reported in the northern half of Iowa. Some areas reported continuous thunderstorm activity for periods ranging from 48 to 72 hours. The total precipitation during the 4-day period averaged approximately 6 inches over the headwaters of the Raccoon River. In the upper basin of the Des Moines River the average rainfall was near 7 inches. A small area at the extreme upper limits of the Iowa drainage basin reported rainfall averaging 10 inches. The upper portion of the Cedar River averaged 6 inches of rainfall during the period. In the middle reaches of these streams amounts were generally 1 to 2 inches and even lighter amounts fell over the lower part of the basins.

In the Floyd River Basin the rainfall varied from 4 to 5 inches over the lower one-third of the valley to 5 to 6 inches over the upper two-thirds of the valley. As much as 7 to 8 inches were reported in a small area in the upper portions. Some of the most intense rains fell just outside the Floyd Valley, in the Rock River and Little Sioux Basins.

As a result of the heavy 4-day rainfall much of the north-central and northwestern parts of Iowa was covered with large areas of standing water. The depressions continued to hold water in some cases for 2 weeks or longer due to the supersaturated condition of the soil and overflowing streams.

As the runoff consolidated and began to move downstream out of the area of heavy rainfall the principal damage was to croplands near the major streams. With crests along the middle Des Moines River well above any previous records, much of the fertile lowland along the stream suffered heavy loss and sustained considerable damage.

Severe flooding developed on the Rock River, and the Big Sioux River from below Sioux Falls, S. Dak., to near Sioux City, Iowa. Flooding also developed on the Floyd River and its tributaries. This flood was minor in comparison to the disastrous flood of June 8, 1953.

The flood on the lower protion of the Big Sioux was the largest that had ever been recorded. The crest at Akron was 0.2 to 0.3 foot higher than the crests of 1951 and 1952. Before records began, a much greater flood seems to have occurred from snow melt runoff in 1881 and appears to have been at least 3 to 4 feet higher.

Flooding in the Ocheyedan River began before midnight of the 19th-20th, reaching flood stage at Everly shortly after midnight, and continued above bankful stage through the 20th. The Little Sioux River reached flood stage at Spencer, Iowa, by late afternoon of the 18th. The main stem of the Little Sioux remained above flood stage from Spencer to Kennebec for a period of approximately 10 days, and was more prolonged than any flood since 1891. Except for the Ocheyedan and West Branch, the Little Sioux tributaries had returned within their banks by the 20th. The stages reached on the main stem of the Little Sioux were considerably lower than the high stages reached in June 1953. The crest of 22.0 feet reached on the West Branch at Moville on the 19th was the highest recorded since the flood of 1891 and fell only 2 feet short of that historic record flood.

A comparative flood crest table is given below comparing the flood this year with previous record floods.

The greatest single loss resulting from these floods was probably to croplands. The U.S. Soil Conservation Service estimated that 725,000 acres of crops were under water in the heavy rain area after the 4 days of rain. Parts of this area drained in sufficient time, but on much of it the water continued to stand for several days--in most cases long enough to kill the growing crops. Many farmers planned to seed as soon as they could get into the fields to work them, but a serious shortage of early maturing soybean seed forced further modification of plans. As a result many were able to put in only early maturing forage crops, and others abandoned plans to use the land this growing season.

As the water moved downstream and the rivers spread over their banks, additional cropland was damaged. The U.S. Corps of Engineers estimates that 105,000 acres of crops were lost from flooding. In the case of those fields flooded by the river, the land itself was often damaged by erosion or by the deposit of silt, sand, and debris. This is in contrast to the damage in the northern part of the State, where standing water only was responsible for the loss. A survey in Webster County alone indicated that some 5,000,000 tons of topsoil were washed off fields in that area.

The monetary value of crop loss is difficult to estimate, since some losses were total while others were only partial; some losses will be partially

IOWA COMPARATIVE CRESTS

River and Station	Flood Stage	June 1954 Stage	Crests* Date	1947 Stage	Crests Date	Previous Maximum of Record Stage	Previous Maximum of Record Date
Upper Mississippi Basin							
Cedar:							
Waterloo, Ia.	15	18.4	23	18.7	June 13	20.4	March 19, 1929
Cedar Rapids, Ia.	13	14.1	26	18.3	June 15	20.1	March 19, 1929
Iowa: Wapello, Ia.	10	12.0	29	16.5	June 9	16.5	June 9, 1947
Boone: Webster City, Ia.	10	18.9	22	----	------	19.1**	June 10, 1918
Raccoon: Jefferson, Ia.	14	19.4	22	----	------	16.2	June 14, 1944
Van Meter, Ia.	13	17.3	25	21.4	June 12	21.4	June 12, 1947
Middle: Indianola, Ia.	11	16.7	16	----	------	20.3	May 22, 1944
Des Moines: Boone, Ia.	12	25.2	23	19.85	June 24	26.9	May 30, 1903
Des Moines, Ia.	23	30.2	24	26.5	June 26	27.3**	May 31, 1903
Tracy, Ia.	14	14.0	17	26.5	June 14	26.5	June 14, 1947
Eddyville, Ia.	15	23.2	27	28.1	June 14	28.1	June 14, 1947
Ottumwa, Ia.	9	16.8	28	20.2	June 7	24.8	May 31, 1903
Missouri Basin							
Big Sioux: Akron, Ia.	16	19.5	22	16.5	June 14	19.4**	Sept. 18, 1926
Floyd: Merrill, Ia.	12	13.9	19-21	-----	------	20.0	Sept. 18, 1926
James, Ia.	16	19.88	22	-----	------	20.3	March 31, 1952
Little Sioux:							
Correctionville, Ia.	19	23.3	21	-----	------	22.5	April 8, 1951
Kennebec, Ia.	20	26.7	21	-----	------	24.4	June 14, 1953

* Provisional
** Prior to gage records

compensated by replanted crops, while late replanting in other cases will result in additional cost and no compensation. The total crop loss along the streams may run between $7,000,000 and $10,000,000. In addition, there is the continuing loss that will result in future years from the erosion of rich topsoil.

A number of homes and other farm buildings were damaged in rural areas.

Only two lives were lost as a result of high water. In one case a farm youth lost his life when he attempted to cross a swollen stream on horseback. In the other, an older man was electrocuted while wiring an electric pump in his flooding basement.

Roads and bridges along the flooding streams were damaged and in some cases destroyed. The steel bridge over the Des Moines River just below Boone was washed out, and other smaller structures suffered structural damage. Approaches to many bridges were washed out, and running water cut through highways at several points.

Urban areas came through the flood in relatively good shape, considering its magnitude. While flood stages were well above the 1947 marks along the middle reaches of the Des Moines, flood damage in the cities was appreciably less. The difference can be attributed to protective measures taken since 1947 and to well-organized action resulting from the timely and accurate warnings. The Red Cross estimates that nearly 1600 homes were damaged and nearly 160 destroyed by the flood waters. Most of these were in urban areas.

It is difficult to estimate the loss of income resulting from suspension of business during the flood. Many business and industrial firms within the city of Des Moines evacuated all or part of their places of business and for all practical purposes were closed during the flood. In many cases they sent their employees to work on flood protection measures, and paid their salaries as usual.

Approximately 7,400 acres of farmland was flooded in the Floyd River Basin. The most widespread and prolonged flooding on cropland was between Merrill and the city limits of Sioux City. Crops in this area were a total loss. Considerable flooding occurred on the West Branch of the Floyd River but the water did not stand so long, so some crops are recovering.

A preliminary estimate in the Big Sioux River Basin indicates that 60 to 70 thousand acres were flooded, resulting in total destruction to most crops in the area. One of the heavier losses was the destruction of levees in the Hawarden and Akron areas.

Heavy damage occurred to cultivated farmland in the Little Sioux Basin. The most total losses occurred between Anthon and Smithland and in the Kennebec-Turin areas. Considerable acreage of cultivated fields were inundated along the West Branch of the Little Sioux and the upper Maple River Basin. The rather severe flooding which occurred along the Ocheyedan covered some cultivated fields, but probably covered a far greater area of pasture lands along the valley. A considerable number of homes and other buildings were damaged, probably the greatest damage of this sort occurring in the Oto-Smithland Section and in the Kennebec-Turin area. However, quite extensive damage of this nature was probably realized in the Ida Grove area and to farm homes and buildings along the West Branch of the Little Sioux. Damage to commercial interests appears to have been chiefly in the area from below Washta through Smithland where telephone and power facilities were disrupted for several days. The widespread, prolonged flooding in the Kennebec-Turin area forced evacuation from quite a few houses.

NOTE: Additional data on the Iowa floods are being presented in the Iowa Monthly Climatological Data and in the forthcoming October issue of this publication.

Other Floods.--The storm that produced excessive rains over northern Iowa also produced excessive rains over southern Minnesota and Wisconsin. These rains were of a local nature and ranged from an average of 6.5 inches in the Trempeleau Valley to 4.3 inches in the Root Basin. Moderate flooding resulted in the Zumbro, Root, Trempealeau and lower Chippewa River Basins. The greatest item of damage was to growing corn, especially in the upper Iowa and Trempealeau River Valleys. There was also considerable corn damage in the Root and Zumbro Basins.

Minor flooding occurred in the Illinois Basin during the first decade of the month and was due to heavy rain (2.5 inches) on the 1st and 3d. The light flooding in the Meramec River at Pacific, Mo., on the 12th was due to heavy rain (1.75 inches) on the 9th and 10th. The flooding along the Mississippi River between Hannibal and Winfield, Mo., was due to heavy flow from the Des Moines River augmented by a rise coming down the main stem. No damage resulted from the slight overflows.

Heavy thunderstorms caused moderate flooding in the upper Chariton and lower Grand Rivers in Missouri and in the north Fork of the Elkhorn in Nebraska in the beginning of the month. Heavy flooding was recorded at Frankfort, Kansas, on the Black Vermillion on the 1st and 2nd. The lower Solomon crested at bankful stages at Niles, Kans.

Heavy rains during the night of the 8th-9th caused flooding on the Big Blue in the vicinity of Barnston and Blue Rapids, Kans., on the 9th and 10th. Torrential rains occurred over the Floyd and Little Sioux Basins during the night of the 9th-10th, with amounts varying from 3 to 5 inches. Small tributaries and the Floyd River at James, Iowa, exceeded flood stage.

A flash flood occurred on the Bad River at Fort Pierre, S. Dak., on the 11th with a crest of 7 feet above bankful stage.

On the night of the 11th-12th heavy rains occurred over the lower Kansas and Marais des Cygne Rivers with an unofficial rainfall report of 5 inches at Stockdale, Kans., just above Tuttle Creek Dam. Smaller feeder tributaries overflowed, but the main stem of the Big Blue crested 5 feet above bankful stage.

Locally heavy scattered showers on the nights of the 14th-15th and 15th-16th caused limited flooding on the Solomon River and middle reaches of the Saline.

The Nemaha River at Falls City, Nebr., crested 8 feet above bankful stage on the 17th, 0.8 foot below the record stage of June 2, 1949. This near record stage was due to heavy thundershowers during the night of the 16th-17th. An unofficial report of 7 inches was reported at Steinauer, Nebr. An official amount of 7 inches was reported at Bennett, Nebr., where the mainline of railroad was washed out and the bridge twisted. The Little Nemaha at Auburn, Nebr., exceeded flood stage by 1½ feet. Lincoln Creek near Seward, Nebr., crested 0.2 foot below the June 1951 high water mark. One bridge over Lincoln Creek near Seward was washed out.

The flooding in the Loup River Basin in Nebraska occurred generally from June 15 to 18, inclusive, and was confined to the lower portions of the North Loup and Middle Loup Basins. Some of the tributaries in these areas experienced rather heavy flooding while others escaped with only minor flooding or none at all. While rainfall was quite heavy in certain localities it was very spotted and localized; in some cases 0.10 inch or less was reported within 5 to 8 miles of points reporting 2 to 5 inches. Showers developed quite generally over the area during the night of June 14-15, but amounts were generally less than 0.5 inch with the 2.65 inches reported from St. Paul, Nebr., quite outstanding. Showers continued in a somewhat scattered and variable pattern through June 17, with heaviest total concentration continuing in the St. Paul area which had a total of about 7 inches from the 14th to the morning of the 17th. During the night of June 16-17 the heavy shower concentrations became more general; and, since most of the soil had been quite well saturated, considerable runoff resulted. The heaviest concentration of showers in Nebraska occurred from the Broken Bow area east and southeastward over the area, including Mason City, Loup City, Farwell, Dannebrog, and St. Paul. From the St. Paul-Dannebrog area the storm belt turned more southeastward, crossing the Platte River into the upper Blue Basin, with rainfall in the St. Libory area unofficially reported in excess of 4 inches, resulting in some flooding along Prairie Creek. Although Broken Bow reported only 0.25 inch, unofficial reports almost surrounding that point within a radius of 5 to 14 miles showed amounts ranging from 1 to 4 inches. Loup City had over 5 inches but appears to have been in the northern edge of the storm area, for Arcadia, some 12 miles to the northwest, unofficially reported 0.50 inch.

The most general flooding appears to have been from Loup City downstream through the St. Paul-Dannebrog area, extending southward to the Flat farmland area in the upper Prairie Creek Basin. Loup City experienced the most severe flooding in 6 years, with the Dannebrog area reporting the highest since 1946. Water got up into some residences in these areas and reached the floors of some industrial areas; but cultivated fields experienced, probably, the greatest cumulative loss with water lingering for days on some of the flat cultivated areas.

The heaviest residential property damage occurred in the Farwell area, where several homes were flooded. Otherwise, damage appears to have been mostly confined to agricultural lands, chiefly in the tributaries of the Middle Loup from the Loup City area through St. Paul. Cultivated fields were probably hardest hit in the St. Paul and Dannebrog areas. There was considerable overflow in the South Loup around Ravenna and downstream, but most areas affected were pasture lands, as appears to be the case, also, with the flooding along the upper Prairie Creek Basin. Some damage occurred to homes and other buildings, including residences and business properties, in Loup City, Dannebrog, and St. Paul; but total damage is believed to have been rather light in these areas. In the vicinity of Farwell, one or two short sections of CB&Q track were washed out, also a few bridges, mostly along county highways across small tributaries.

The flooding in the Elkhorn Basin on the North Fork River at Pierce, Nebr., from the 20th to the 21st was due to heavy rains on the 20th. The precipitation averaged 2.5 inches over the entire drainage area, with heavier amounts averaging 3.5 inches over the northern and northeastern sections of the basin. Practically all streams ran bankful or higher from the 20th through the 23d. The most extensive flooding was along Logan Creek in the vicinity of Pender, Nebr., along the Elkhorn between West Point and Scribner; along Omaha Creek from Walthill to Homer; and at the mouth of Plum Creek above West Point, Nebr.

Rapid snowmelt runoff during the third week of June caused the Yellowstone River to rise to bankful stage at Livingston, Mont., and to near bankful stage in the reach below to Billings, Mont., from the 24th to the 28th. No damage was reported.

Ohio Basin.--Heavy thundershowers occurred in the upper portion of the Ohio River Basin during the afternoon and evening of the 1st, causing local flooding and damage in several areas (Greensburg, Washington, Butler, and Beaver Falls, Pa.), but the main rivers and tributaries remained at low stages. A severe thunderstorm accompanied by heavy showers occurred during the night of the 10th and resulted in local flooding along Washington Boulevard in the east end of Pittsburgh, along Route 88 in the vicinity of Mc Neilly Road, and in the low areas of Castle Shannon. Flash floods occurred in several residential and business areas of the Tri-State District on the 16th, endangering lives and causing damage to homes, stores, autos, and other property. Small streams and creeks rose so quickly that in some cases people barely escaped with their lives. Four inches of rainfall was reported at Steubenville, Ohio, on the afternoon of the 16th. It flooded business houses, basements, and roads and washed tons of dirt and debris off hillsides into the streets. The area in between Bridgeville and McDonald, Pa., was the hardest hit. Many homes in the area were partly submerged.

Brief flash floods occurred in Wood and Pleasants Counties, West Virginia, in Cow and Bull Creeks, tributaries of the Ohio River. Some damage resulted to crops and hay in the Bull Creek area. In the Cow Creek area, several homes were flooded and fences and outbuildings washed away.

Lower Mississippi Basin.--The flooding on the St. Francis River at Fisk, Mo., between the 10th and 16th was due to heavy rain on the 8th and 9th. The rainfall averaged 2.2 inches in the area above Wappapello Dam.

WEST GULF OF MEXICO DRAINAGE

Rio Grande Flood.--The storm of June 25-28 produced the maximum flood of record on the middle Rio Grande and lower Pecos Rivers. At Laredo, Tex., the Rio Grande reached a stage of 62.21 feet, which is 12.6 feet above the 1932 flood, the previous maximum of record. There are no official gages on the lower Pecos River but unofficial flood marks in the vicinity of the Pecos River Bridge on U. S. Highway 90 were 85 feet above the stream bed and approximately 30 feet above the roadway of the bridge. From reports of the Texas Highway Department there were actually two flood crests at this point on the river. The river rose to approximately 70 feet above the stream bed on the night of June 26, at which time the trusses of the bridge were washed away. On the night of June 27, the river again rose to 85 feet, at which time the center pier of the bridge was completely washed away.

Both of these floods were the direct result of the atmospheric circulation of the dying Hurricane "Alice" remaining over the Lower Pecos Watershed for about 3 days. Upper air charts showed a closed circulation up to at least the 500 mb level and this coupled with the terrain of that section made it ideal for the heavy rain to occur.

The isohyetal map for this storm shows a 24-inch center which was about 50 miles long and 15 miles wide. The area falling within the 4.0-inch isohyet is elliptical in shape and about 110 miles in length. It is slightly off center with the center right over the Pecos River in the vicinity of Pandale and Sheffield, Tex. The heavier side of the ellipse lies over the Devils River watershed.

Sixteen persons were drowned in the local flash flood at Ozona, Tex. Thirty-eight persons were drowned in Piedras Negras, Mexico (across the river from Eagle Pass, Tex.) where the people did not heed the warnings but lagged behind and took refuge on the roofs of their adobe built homes which disintegrated when the water struck the foundations.

The U. S. Border Patrol was instrumental in getting the warnings to all the area from Del Rio to the Falcon Reservoir, and undoubtedly saved many lives as there were many homes in that area without even a radio. Practically every means of travel was stopped in the area from Del Rio to Laredo, and even all bridges were destroyed in the area. The Air Force moved in planes and helicopters for rescue work. Helicopters were used in search of all areas for victims. They were also used to remove passengers of a transcontinental train that was stalled between washed-out bridges at Langtry.

The preliminary figures on the flow past Laredo show 429,000 cubic feet per second. This volume of water, if it had passed on downstream to the Valley, would have caused the greatest damage ever to occur from a flood in this section. Falcon Reservoir, with a capacity of 4,085,000 acre feet, was nearly empty before the flood. It took the 2,100,000 acre-foot flow without any spill.

Other Floods.--The heavy rains (amounts up to 12 inches) on the last of May caused flooding on the upper Nueces River above Three Rivers, Tex., for several days. It crested at Tilden Crossing, Tex., at a stage of 15.6 feet on the 10th. Only minor damage was reported from the flooding as most of the territory flooded was ranch country.

Columbia Basin.--The overall weather pattern was favorable for the depletion of snow-fields in the Columbia Basin with a minimum of disastrous flooding. Except in rather local headwater areas there was no disastrous flooding. The Columbia River which went above flood stage at Vancouver, Wash., on May 20 was at a stage of 17.9 feet, 2.9 feet above flood stage, at the close of June. The Willamette River at Portland, Oreg., which went above flood stage on May 23 continued above flood stage until June 28 with the exception of June 12 and 13. There was no damage except that caused by inundation of pastureland and possible slight bank erosion.

FLOOD STAGE DATA

Table 5

(All dates in June unless otherwise specified)

JUNE 1954

River and station	Flood stage	Above flood stages -dates		Crest *	
		From—	To—	Stage	Date
MISSISSIPPI SYSTEM Upper Mississippi Basin	Ft.			Ft.	
Chippewa: Durand, Wis.	11	20	22	11.9	21
Zumbro:					
Theilman, Minnesota	37	20	21	40.2	20
Zumbro Falls, Minnesota	12	20	22	19.5	20
Trempealeau: Dodge Wis.	7	21	22	7.8	21
Root River:					
Lanesboro, Minnesota	7	19	19	7.2	19
Hoka, Minnesota	47	20	21	48.0	21
Cedar:					
Charles City, Iowa	--	--	--	16.1	21
Waterloo, Iowa	15	23	24	18.4	23
Cedar Rapids, Iowa	13	26	26	14.1	26
Iowa:					
Marshalltown, Iowa	13	1 10 16 22	2 12 17 28	14.2 15.2 16.0 15.5	2 11 16 25
Wapello, Iowa	10	28	**	12.0	29
Boone: Webster City, Iowa	10	20	**	18.9	21
Raccoon:					
Jefferson, Iowa	14	22	26	19.4	22
Van Meter, Iowa	13	25	27	17.3	25
Des Moines, Iowa (18th St.)	13	24	27	15.7	26
Middle: Indianola, Iowa	11	12 16	12 16	11.7 16.7	12 16
Des Moines:					
Humbolt, Iowa	8	19	25	11.3	22
Boone, Iowa	12	21	26	25.2	23
Des Moines, Iowa (Second Ave.)	23	23	27	30.2	24
Tracy, Iowa	14	17 23	17 **	14.0 22.1	17 27
Eddyville, Iowa	15	24	**	23.2	27
Ottumwa, Iowa	9	25	**	16.8	28
Illinois:					
La Salle, Illinois	20	4	4	#20.3	4
Havana, Illinois	14	6	10	14.3	6
Meramec: Pacific, Missouri	11	12	12	11.2	12
Mississippi:					
Hannibal, Missouri	16	July 1	July 3	16.5	July 2
Louisiana, Missouri	15	July 2	July 4	15.6	July 4
Dam 24 (Clarksville, Missouri)	23	30	July 5	#25.2	July 3
Dam 25 (Winfield, Missouri)	23	30	July 6	#25.1	July 4
Missouri Basin					
Rock River: Rock Valley, Iowa	10	19	23	15.9	21
Big Sioux: Akron, Iowa	16	20	24	19.68 19.95	21 22
Floyd:					
Merrill, Iowa	12	19	21	13.9 13.9	19 21
James, Iowa	16	11 19	12 24	16.4 19.4 19.88	11 20 22
Ocheyedan: Everly, Iowa	10	20	23	10.9	22
West Branch: Moville, Iowa	16	18	21	22.0	19
Little Sioux: Spirit Lake, Iowa	8	19	25	11.6	21
MISSISSIPPI SYSTEM (Cont'd.) Missouri Basin (Cont'd.)	Ft.			Ft.	
Little Sioux (Cont'd):					
Spencer	10	18	30	16.7	21
Peterson, Iowa	16	19	26	19.3	20
Cherokee, Iowa	18	19	27	20.8	23
Washta, Iowa	12	11 13 18	11 14 30	13.2 10.8 19.2	11 14 21
Correctionville, Iowa	19	19	27	23.3	21
Oto, Iowa	22	20	27	25.1	21
Kennebec, Iowa	20	19	28	26.7	21
Maple: Mapleton, Iowa	19	20	20	20.4	20
Boyer: Logan, Iowa	19	--	--	18.4	21
North Branch, Elkhorn:					
Pierce, Nebraska	12	3 20	3 21	13.45 13.15	3 20
Saline: Wilson, Kansas	12	16	17	14.85	16
Solomon:					
Alton, Kansas	12	16	--	16.1	16
Beloit, Kansas	20	17	--	20.1	17
Black Vermillion:					
Frankfort, Kansas	18	1	2	24.3	1
Big Blue:					
Crete, Nebraska	16	10 18	-- 20	16.8 20.0	10 19
Barnston, Nebraska	18	9 17	-- 18	23.7 20.9	9 18
Blue Rapids, Kansas	20	10 18	10 18	22.0 20.0	10 18
Nemaha: Falls City, Nebraska	20	9 17	9 18	21.7 27.85	9 17
Grand:					
Sumner, Missouri	26	2	4	28.7	3
Brunswick, Missouri	12	3	5	12.75	4
Chariton: Novinger, Missouri	20	1 3	2 4	22.6 22.7	1 3
Missouri: Waverly, Missouri	18	23	24	18.4	24
Lower Mississippi Basin					
St. Francis: Fisk, Missouri	20	10	16	22.7	13
WEST GULF OF MEXICO DRAINAGE					
Rio Grande:					
Del Rio, Texas	15	27	30	33.7 38.25 36.0	27 28 28
Eagle Pass, Texas	16	27	30	42.6 53.61	28 29
Laredo, Texas	30	29	July 1	60.52 62.21	30 30
PACIFIC SLOPE DRAINAGE Columbia Basin					
Columbia: Vancouver, Washington	15	May 20	**	#20.0	19
Willamette: Portland, Oregon	18	May 22	28	#19.8	19

* Provisional

** Continued at end of month

# Highest stage reported but not necessarily the crest

RADIOSONDE DATA

Average monthly values

Table 20

JUNE 1954

	ALBUQUERQUE, N. MEX. (835 MB.)				ATLANTA, GA. (982 MB.)				BISMARCK, N. DAK. (951 MB.)				BOISE, IDAHO (912 MB.)				BROWNSVILLE, TEX. (1011 MB.)				BUFFALO, N. Y. (991 MB.)				BURRWOOD, LA. (1015 MB.)			
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	1,619	26.2	19	30	309	23.7	69	30	505	17.3	73	30	868	19.0	47	29	7	26.5	83	30	221	17.6	80	30	3	26.2	84
1000---	30	12			30	143			30	73			30	67			29	107	26.0	82	30	108			30	132	25.5	80
950----	30	461			30	594	24.5	56	30	521	16.6	70	30	516			29	562	22.9	80	30	556	18.8	64	30	588	22.9	74
900----	30	947			30	1,068	21.4	57	30	977	15.9	60	30	981	18.8	41	29	1,029	21.4	65	30	1,012	16.1	66	30	1,053	20.2	67
850----	30	1,457			30	1,560	17.9	57	30	1,460	12.8	58	30	1,469	15.6	37	29	1,523	19.4	54	30	1,497	13.3	67	30	1,544	17.3	61
800----	30	1,991	24.2	18	30	2,076	14.4	57	30	1,967	9.5	55	30	1,979	11.3	42	29	2,042	16.7	47	30	2,004	10.3	65	30	2,060	14.4	56
750----	30	2,552	19.4	20	30	2,622	11.3	48	30	2,509	7.2	56	30	2,519	7.1	47	29	2,594	13.7	42	30	2,544	7.2	65	30	2,607	11.3	48
700----	30	3,138	14.1	24	30	3,192	8.3	43	30	3,066	3.9	52	30	3,077	2.7	52	29	3,167	10.4	38	30	3,104	4.0	60	30	3,176	8.0	41
650----	30	3,757	8.5	29	29	3,810	4.6	41	30	3,671	- .1	51	30	3,678	- 1.5	51	28	3,782	6.5	33	30	3,708	.7	55	30	3,788	4.7	41
600----	30	4,412	2.6	35	29	4,451	.6	38	30	4,300	- 4.2	47	30	4,305	- 5.4	52	28	4,431	2.9	32	30	4,342	- 2.9	53	30	4,431	.6	37
550----	30	5,104	- 3.5	41	28	5,146	- 3.8	37	30	4,986	- 8.3	47	30	4,989	- 9.7	52	28	5,129	- 1.5		30	5,031	- 6.9	51	30	5,123	- 3.6	35
500----	30	5,852	- 9.3	43	28	5,890	- 8.5		29	5,711	-13.1	42	30	5,712	-14.2	48	28	5,882	- 6.2		30	5,765	-11.5	48	30	5,871	- 8.6	33
450----	30	6,668	-14.6	36	28	6,709	-14.2		29	6,516	-18.8	45	30	6,515	-19.8	46	28	6,705	-11.9		29	6,569	-16.7	41	30	6,693	-13.9	33
400----	30	7,542	-20.8		28	7,583	-20.5		28	7,368	-24.8	41	30	7,366	-26.1	42	28	7,589	-18.1		29	7,438	-22.7	43	30	7,565	-20.0	30
350----	30	8,514	-27.7		28	8,556	-27.7		27	8,330	-32.0	39	30	8,318	-33.5	41	28	8,573	-25.2		29	8,403	-30.1	43	30	8,540	-27.2	
300----	30	9,603	-36.1		28	9,644	-36.2		27	9,400	-40.1		30	9,381	-41.5		28	9,673	-33.7		28	9,475	-38.5		30	9,631	-35.5	
250----	29	10,838	-45.6		28	10,882	-45.9		27	10,620	-48.8		30	10,596	-49.1		28	10,925	-43.6		28	10,704	-46.7		30	10,874	-44.9	
200----	29	12,289	-56.0		28	12,331	-56.4		27	12,063	-54.7		29	12,048	-54.1		27	12,385	-55.8		27	12,149	-55.7		30	12,330	-55.3	
175----	29	13,128	-60.6		26	13,168	-60.8		27	12,915	-55.5		29	12,903	-54.9		27	13,222	-62.3		26	12,990	-59.2		30	13,171	-60.2	
150----	29	14,078	-64.0		26	14,117	-64.4		27	13,895	-55.9		27	13,886	-55.4		27	14,159	-68.5		23	13,951	-60.4		30	14,121	-64.6	
125----	29	15,188	-66.1		26	15,222	-67.1		27	15,052	-56.8		25	15,033	-56.1		26	15,239	-72.9		17	15,080	-60.0		30	15,224	-68.1	
100----	24	16,513	-66.9		25	16,567	-66.8		27	16,459	-58.2		21	16,450	-56.4		24	16,541	-74.0		10	16,467	-59.0		25	16,546	-70.3	
80-----	23	17,864	-64.1		22	17,922	-63.4		26	17,866	-57.2		17	17,851	-55.6		22	17,858	-69.2		5	17,845	-57.2		24	17,875	-68.0	
60-----	19	19,653	-59.1		20	19,707	-59.6		25	19,691	-54.9		14	19,682	-54.7		20	19,614	-61.6						22	19,628	-61.8	
50-----	18	20,803	-56.9		19	20,851	-57.8		25	20,860	-53.8		14	20,849	-54.2		18	20,750	-58.4						18	20,765	-59.1	
40-----	14	22,229	-54.0		15	22,268	-55.2		22	22,305	-52.6		10	22,263	-53.5		10	22,154	-54.1						14	22,170	-56.6	
30-----					12	24,112	-50.8		15	24,179	-50.4																	
20-----									8	26,841	-48.4																	

	CARIBOU, ME. (990 MB.)				CHARLESTON, S. C. (1014 MB.)				COLUMBIA, MO. (984 MB.)				DODGE CITY, KANS. (920 MB.)				EL PASO, TEX. (878 MB.)				ELY, NEV. (806 MB.)				GLASGOW, MONT. (935 MB.)			
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	191	14.2	77	30	13	23.7	84	30	238	23.8	69	30	792	24.8	49	30	1,195	29.2	23	30	1,908	17.9	30	30	648	17.3	55
1000---	30	109			30	133	24.7	77	30	98			30	45			30	11			30	21			30	62		
950----	30	549	14.2	63	30	589	23.4	64	30	553	25.5	57	30	503			30	484			30	485			30	511		
900----	30	999	11.9	62	30	1,055	20.7	61	30	1,025	22.1	58	30	981	25.2	44	30	974			30	960			30	968	15.9	50
850----	30	1,475	9.1	65	30	1,547	17.5	59	30	1,519	18.8	57	30	1,481	22.2	44	30	1,478	28.0	22	30	1,452			30	1,450	12.1	54
800----	30	1,975	6.1	65	30	2,062	14.3	54	30	2,037	15.6	53	30	2,005	18.8	44	30	2,011	23.8	22	30	1,977	18.4	27	30	1,954	8.3	59
750----	30	2,507	3.5	61	30	2,610	11.5	44	30	2,587	12.6	43	30	2,561	15.2	41	30	2,574	18.9	24	30	2,526	14.2	27	30	2,489	4.8	59
700----	30	3,059	.8	53	30	3,179	8.4	38	30	3,157	9.1	42	30	3,137	11.2	38	30	3,154	13.4	29	30	3,102	9.2	32	30	3,043	1.3	57
650----	30	3,655	- 2.2	45	30	3,793	4.9	33	29	3,769	5.2	40	30	3,755	7.1	34	30	3,776	7.8	36	30	3,714	3.8	40	30	3,641	- 2.5	56
600----	29	4,286	- 5.8	43	30	4,435	.7	31	29	4,414	.9	37	30	4,404	2.5	34	30	4,425	2.6	39	30	4,355	- 1.5	45	30	4,267	- 6.3	52
550----	29	4,965	- 9.8	37	30	5,129	- 3.6	28	29	5,105	- 3.8	33	30	5,104	- 2.5	31	30	5,122	- 2.6	40	30	5,041	- 7.1	49	30	4,946	-10.6	49
500----	28	5,694	-14.5		30	5,875	- 8.5	31	28	5,848	- 8.8	28	30	5,850	- 7.9		30	5,871	- 7.7	29	30	5,778	-12.5	51	30	5,669	-15.4	47
450----	28	6,492	-20.0		30	6,695	-13.8		27	6,670	-14.3		30	6,670	-13.7		30	6,695	-13.1		30	6,585	-17.7	42	30	6,465	-20.9	43
400----	28	7,348	-26.4		30	7,569	-19.9		27	7,541	-21.0		30	7,547	-20.1		29	7,570	-19.3		30	7,448	-23.5	35	30	7,316	-26.7	40
350----	28	8,299	-33.1		30	8,545	-26.8		27	8,512	-28.5		30	8,521	-27.5		29	8,548	-27.0		30	8,410	-30.7		30	8,265	-33.5	39
300----	28	9,364	-40.8		30	9,637	-35.2		27	9,597	-36.8		30	9,611	-35.9		29	9,640	-35.6		29	9,477	-39.2		30	9,329	-41.0	
250----	28	10,582	-48.8		30	10,880	-45.1		27	10,832	-46.4		29	10,855	-45.1		29	10,882	-45.2		29	10,701	-48.0		30	10,544	-49.1	
200----	27	12,037	-54.4		30	12,333	-55.9		27	12,280	-56.2		29	12,310	-55.6		28	12,337	-56.2		29	12,150	-54.7		30	11,993	-52.3	
175----	27	12,889	-55.7		30	13,171	-61.1		27	13,118	-60.8		29	13,151	-60.1		28	13,175	-61.4		29	12,997	-57.7		29	12,860	-52.7	
150----	26	13,861	-56.6		30	14,118	-65.2		27	14,066	-64.7		29	14,103	-63.7		28	14,120	-65.8		29	13,965	-59.5		29	13,854	-53.1	
125----	26	15,017	-56.4		30	15,220	-67.4		27	15,172	-66.5		29	15,215	-65.6		28	15,216	-69.3		29	15,101	-61.2		29	15,026	-54.0	
100----	26	16,429	-57.2		30	16,563	-67.3		24	16,523	-65.1		25	16,572	-65.4		25	16,544	-69.9		28	16,482	-60.5		28	16,452	-55.7	
80-----	23	17,846	-56.4		27	17,919	-63.7		24	17,886	-63.1		18	17,923	-62.2		21	17,883	-65.9		28	17,874	-59.6		28	17,875	-54.5	
60-----	21	19,683	-54.7		26	19,701	-59.3		21	19,666	-59.7		16	19,724	-58.4		20	19,652	-60.3		27	19,683	-56.3		26	19,723	-53.5	
50-----	21	20,851	-53.6		25	20,849	-57.4		19	20,808	-57.3		16	20,876	-56.1		18	20,794	-57.5		23	20,846	-55.2		23	20,901	-52.3	
40-----	20	22,296	-52.4		24	22,264	-55.1		15	22,217	-54.3		14	22,309	-53.4		15	22,208	-54.1		18	22,268	-53.6		20	22,349	-51.6	
30-----	16	24,146	-51.0		22	24,118	-51.2		9	24,087	-51.8		5	24,170	-51.2		11	24,069	-51.4		13	24,108	-51.9		15	24,222	-49.9	
20-----	9	26,769	-48.4		10	26,754	-47.8										5	26,726	-47.6						5	26,838	-49.1	

	GRAND JUNCTION, COLO. (848 MB.)				GREAT FALLS, MONT. (884 MB.)				GREEN BAY, WIS. (987 MB.)				GREENSBORO, N. C. (985 MB.)				HATTERAS, N. C. (1015 MB.)				HILO, T. H. (1015 MB.)				INTERNAT. FALLS, MINN. (968 MB.)			
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	1,474	23.5	22	30	1,122	14.5	57	30	210	17.9	81	30	273	21.4	76	30	3	23.8	83	30	9	25.5	74	30	360	16.1	71
1000---	30	1			30	67			30	99			30	136			30	132	23.2	80	30	145	22.8	75	30	84		
950----	30	468			30	517			30	550	19.5	67	30	588	23.4	57	30	585	20.9	74	30	590	19.0	81	30	522	16.8	63
900----	30	947			30	977			30	1,006	17.5	61	30	1,056	20.1	58	30	1,046	18.4	68	30	1,053	15.8	85	30	983	14.2	63
850----	30	1,449	22.5		30	1,455	12.7	51	30	1,492	14.8	60	30	1,546	16.6	60	30	1,534	15.4	65	30	1,537	12.9	86	30	1,462	11.0	67
800----	30	1,978	22.3		30	1,961	9.0	55	30	2,004	12.4	54	30	2,059	13.2	58	30	2,046	12.5	59	30	2,045	11.4	72	30	1,966	8.3	64
750----	30	2,535	17.1	22	30	2,494	4.9	61	30	2,547	9.4	50	30	2,603	10.0	53	30	2,594	9.6	53	30	2,591	10.2	41	30	2,501	5.6	59
700----	30	3,115	11.8	27	30	3,051	.8	66	30	3,111	6.1	44	30	3,170	7.2	43	30	3,154	6.7	46	30	3,156	8.8	26	30	3,058	2.9	52
650----	30	3,732	6.2	33	30	3,646	- 3.0	63	30	3,715	2.4	42	30	3,784	3.9	45	30	3,766	3.4	42	30	3,772	6.0		29	3,659	- .1	45
600----	30	4,379	.7	40	30	4,272	- 7.0	55	30	4,357	- 1.7	42	30	4,423	.1	40	30	4,404	- .3	38	30	4,416	2.3		29	4,292	- 3.9	45
550----	30	5,069	- 5.2	45	29	4,951	-11.2	50	30	5,041	- 6.0	42	30	5,119	- 3.9		30	5,100	- 4.3		30	5,111	- 1.9		29	4,975	- 8.6	44
500----	30	5,812	-10.7	43	29	5,672	-16.2	48	30	5,783	-10.9	37	30	5,861	- 8.6		30	5,839	- 8.8		30	5,865	- 6.5		29	5,705	-13.2	42
450----	30	6,619	-16.5	39	29	6,465	-21.8	50	30	6,591	-16.2	35	30	6,682	-13.9		30	6,660	-14.2		30	6,692	-12.2		29	6,509	-18.4	41
400----	30	7,489	-22.5	36	29	7,313	-27.9	45	30	7,460	-22.2	34	30	7,554	-20.1		30	7,530	-20.5		30	7,570	-18.9		29	7,369	-24.3	41
350----	30	8,454	-29.7		29	8,258	-34.9	43	29	8,428	-29.5		30	8,529	-27.3		30	8,504	-27.6		30	8,548	-26.7		29	8,326	-31.7	
300----	30	9,534	-37.9		29	9,314	-42.8		29	9,508	-37.7		29	9,617	-35.7		30	9,593	-36.0		30	9,641	-35.3		29	9,397	-39.8	
250----	30	10,763	-47.3		29	10,521	-50.1		20	10,739	-46.9		28	10,858	-45.5		30	10,831	-45.8		30	10,882	-45.3		29	10,616	-48.4	
200----	29	12,213	-55.9		29	11,964	-53.2		29	12,188	-55.7		27	12,307	-56.2		30	12,279	-56.7		30	12,333	-56.7		29	12,058	-55.1	
175----	29	13,055	-58.7		28	12,828	-53.2		29	13,030	-59.1		26	13,148	-61.0		30	13,114	-61.7		30	13,166	-62.7		29	12,907	-56.1	
150----	29	14,018	-60.5		28	13,818	-54.1		29	13,990	-60.7		26	14,097	-63.9		30	14,059	-64.8		30	14,102	-68.2		28	13,884	-56.2	
125----	29	15,145	-62.8		28	14,985	-54.7		29	15,122	-61.3		26	15,208	-65.1		29	15,169	-64.8		30	15,185	-71.6		28	15,039	-56.7	
100----	28	16,512	-62.8		24	16,410	-55.9		29	16,508	-61.0		26	16,568	-64.4		26	16,524	-64.5		29	16,491	-73.6		27	16,451	-56.9	
80-----	28	17,890	-61.0		23	17,832	-55.5		29	17,898	-59.3		25	17,939	-61.9		23	17,897	-62.3		26	17,794	-71.8		24	17,863	-56.6	
60-----	28	19,691	-57.4		20	19,669	-54.0		27	19,706	-56.7		21	19,731	-58.4		21	19,685	-58.6		24	19,518	-65.3		21	19,697	-55.1	
50-----	27	20,847	-55.6		18	20,848	-53.2		27	20,866	-55.0		21	20,882	-56.4		20	20,835	-56.9		21	20,631	-62.8		21	20,862	-54.2	
40-----	23	22,280	-54.0		17	22,285	-52.1		26	22,298	-53.4		18	22,312	-54.1		19	22,251	-54.8		20	22,013	-59.7		17	22,307	-52.7	
30-----	15	24,136	-51.6		16	24,156	-50.2		20	24,159	-51.4		13	24,163	-51.7		11	24,110	-51.8		14	23,825	-54.9		14	24,170	-50.4	
20-----	5	26,787	-49.2						8	26,828	-49.2														0	26,834	-48.4	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

JUNE 1954

Standard pressure surface (mb.)	LAKE CHARLES, LA. (1014 MB.)				LANDER, WYO. (826 MB.)				LAS VEGAS, NEV. (930 MB.)				LITTLE ROCK, ARK. (1004 MB.)				MAZATLAN, MEXICO (1007 MB.)				MEDFORD, ORE. (968 MB.)				MIAMI, FLA. (1015 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	5	25.2	81	30	1,696	17.5	33	30	660	31.2	13	30	79	26.9	66	30	14	27.5	80	30	401	18.5	51	30	4	25.7	83
1000	30	127	25.3	76	30	25			30	6			30	111	27.1	64	30	80	26.7	80	30	118			30	139	25.5	79
950	30	580	23.1	71	30	482			30	476			30	571	26.3	59	30	543	24.1	69	30	561	17.5	49	30	595	22.8	77
900	30	1,049	20.7	64	30	956			30	955	29.6		30	1,042	22.6	64	30	1,007	23.4	60	30	1,018	13.9	53	30	1,060	20.2	72
850	30	1,541	18.1	58	30	1,449			30	1,460	25.2	18	30	1,537	19.1	63	30	1,505	20.8	67	30	1,497	10.1	60	30	1,551	17.3	69
800	30	2,058	15.4	51	30	1,970	17.1	26	30	1,987	20.4	20	30	2,056	15.8	59	30	2,028	18.1	69	30	1,998	6.4	66	30	2,067	14.3	68
750	30	2,604	12.2	50	30	2,519	12.3	30	30	2,545	15.4	25	30	2,607	12.7	52	30	2,589	15.5	60	30	2,531	3.3	65	30	2,613	11.3	63
700	30	3,178	8.9	47	30	3,088	7.2	36	30	3,117	10.1	30	30	3,178	9.4	43	25	3,163	12.2	55	30	3,081	.5	56	30	3,183	7.8	61
650	30	3,791	5.3	42	30	3,693	2.1	42	30	3,731	5.0	34	30	3,794	5.9	38	24	3,788	8.2	59	30	3,679	- 2.8	50	30	3,798	4.1	61
600	30	4,437	1.4	36	30	4,332	- 2.8	44	30	4,375	.7	32	30	4,440	1.8	34	24	4,437	3.5	66	30	4,302	- 6.3	40	29	4,438	.2	62
550	30	5,133	- 3.0		30	5,014	- 7.6	44	30	5,070	- 3.8	31	30	5,139	- 2.5	29	24	5,145	- 1.4	68	30	4,980	-10.1	34	29	5,133	- 3.7	56
500	30	5,881	- 7.9		30	5,749	-13.0	46	30	5,815	- 8.5		30	5,886	- 6.9	27	24	5,891	- 6.1	60	30	5,707	-14.5	38	29	5,878	- 7.9	50
450	30	6,703	-13.2		30	6,549	-18.9	48	30	6,633	-14.1		30	6,710	-12.5		18	6,721	-10.8		30	6,506	-19.7	35	29	6,704	-12.8	43
400	30	7,580	-19.1		30	7,409	-25.4	45	30	7,506	-21.0		30	7,589	-18.9		17	7,605	-16.5		30	7,361	-25.4		29	7,579	-18.8	42
350	29	8,557	-26.5		30	8,363	-32.5	41	30	8,477	-28.8		30	8,569	-26.4		15	8,589	-24.0		29	8,311	-32.5		29	8,559	-25.7	41
300	28	9,651	-34.7		29	9,430	-40.7		30	9,559	-37.6		30	9,664	-34.8		8	9,694	-32.5		28	9,381	-40.5		29	9,656	-34.1	42
250	27	10,895	-44.6		27	10,647	-49.3		30	10,789	-47.3		29	10,908	-44.5		5	10,943	-43.0		28	10,599	-48.8		29	10,903	-44.4	
200	23	12,350	-55.5		26	12,091	-55.3		30	12,232	-56.6		29	12,368	-55.0						27	12,053	-55.0		29	12,357	-56.2	
175	23	13,190	-60.5		23	12,925	-56.7		29	13,082	-60.2		28	13,207	-60.2						27	12,904	-55.7		29	13,193	-61.9	
150	22	14,134	-65.8		21	13,899	-58.5		29	14,034	-63.3		28	14,158	-64.8						26	13,883	-56.6		29	14,133	-66.8	
125	21	15,229	-68.7		21	15,043	-59.4		28	15,142	-65.1		27	15,259	-66.6						24	15,039	-57.1		25	15,223	-70.6	
100	20	16,558	-70.2		20	16,430	-59.9		26	16,512	-65.3		24	16,600	-67.6						22	16,439	-57.3		20	16,540	-71.0	
80	18	17,884	-67.5		19	17,828	-58.6		25	17,881	-62.2		20	17,956	-65.0						20	17,856	-56.6		19	17,872	-67.3	
60	17	19,635	-62.4		18	19,651	-56.1		25	19,672	-58.5		19	19,736	-59.9						19	19,679	-54.8		17	19,627	-62.6	
50	16	20,772	-58.6		18	20,813	-54.7		25	20,823	-56.4		19	20,883	-56.9						19	20,845	-54.4		17	20,758	-59.4	
40	15	22,179	-55.7		14	22,241	-52.9		22	22,255	-53.9		17	22,300	-54.2						16	22,277	-53.7		15	22,164	-56.4	
30	11	24,026	-52.6		6	24,109	-50.4		18	24,114	-51.0		14	24,153	-51.0						7	24,167	-52.1		5	24,048	-52.8	
20									9	26,743	-47.4																	
15									6	28,689	-44.1																	

Standard pressure surface (mb.)	MIDLAND, TEX. (913 MB.)				NANTUCKET, MASS. (1012 MB.)				NASHVILLE, TENN. (995 MB.)				NORTH PLATTE, NEBR. (912 MB.)				OAKLAND, CALIF. (1013 MB.)				OKLAHOMA CITY, OKLA. (967 MB.)				OMAHA, NEBR. (976 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	871	26.9	49	30	14	14.2	92	30	177	24.0	73	30	848	21.5	62	30	6	16.2	69	26	391	25.0	63	30	300	24.3	66
1000	30	51			30	117	15.7	82	30	130			30	34			30	118	15.1	70	26	91			30	80		
950	30	515			30	555	16.2	66	30	582	24.3	55	30	494			30	559	15.3	59	26	553	26.2	54	30	536	23.8	61
900	30	995	26.2	49	30	1,012	14.1	64	30	1,053	20.8	58	30	961	22.5	53	30	1,012	16.0	41	26	1,021	23.3	57	30	1,004	21.0	60
850	30	1,497	22.7	51	30	1,493	11.4	63	30	1,544	17.2	59	30	1,457	20.4	47	30	1,495	14.2	36	26	1.518	20.1	57	30	1,497	18.2	59
800	30	2,022	19.6	50	30	1,997	8.6	59	30	2,059	14.5	53	30	1,978	17.6	45	30	2,004	11.7	32	26	2,038	16.9	50	30	2,014	15.4	53
750	30	2,584	15.9	47	30	2,533	6.3	50	30	2,604	11.3	48	30	2,530	14.2	42	30	2,550	8.6	29	26	2,590	14.0	37	30	2,563	11.9	53
700	30	3,157	11.8	47	30	3,092	3.3	48	30	3,175	8.1	43	30	3,105	10.2	42	30	3,108	5.4	26	26	3,163	10.3	35	30	3,133	8.3	50
650	30	3,779	7.3	45	30	3,691	- .2	47	30	3,787	4.7	39	30	3,721	5.6	44	30	3,716	1.9	27	26	3,780	6.5	29	30	3,744	4.3	46
600	29	4,427	2.9	41	30	4,325	- 4.0	41	30	4,431	.8	36	30	4,366	.9	43	29	4,351	- 1.7	30	25	4,429	2.4	24	29	4,390	.0	43
550	28	5,126	- 1.8	35	30	5,007	- 8.0	40	30	5,129	- 3.8	37	29	5,066	- 4.3	42	29	5,042	- 5.8	28	25	5,131	- 2.0		29	5,082	- 4.7	36
500	28	5,877	- 6.6		30	5,741	-12.9	38	30	5,870	- 8.5		29	5,807	-10.0	42	29	5,778	-10.7		25	5,877	- 6.9		29	5,825	- 9.6	
450	28	6,703	-12.4		30	6,542	-18.2	35	30	6,691	-13.9		28	6,617	-15.7		29	6,592	-16.2		25	6,703	-12.7		29	6,638	-15.2	
400	28	7,581	-18.7		30	7,406	-24.2	33	30	7,564	-19.8		28	7,487	-22.2		29	7,457	-22.4		25	7,577	-19.4		29	7,511	-21.3	
350	27	8,563	-26.0		30	8,364	-31.5		30	8,539	-27.2		28	8,454	-29.5		29	8,421	-30.1		25	8,555	-26.4		29	8,480	-28.6	
300	27	9,659	-34.4		30	9,437	-38.9		30	9,630	-35.5		26	9,536	-37.6		28	9,504	-38.5		25	9,650	-34.7		28	9,571	-36.8	
250	26	10,903	-44.1		29	10,660	-46.8		30	10,873	-44.9		25	10,770	-46.9		28	10,731	-47.6		24	10,899	-44.4		28	10,807	-45.8	
200	22	12,368	-55.0		27	12,114	-53.7		30	12,330	-55.5		23	12,205	-55.6		27	12,185	-55.8		24	12,357	-55.0		25	12,271	-55.0	
175	22	13,209	-60.7		27	12,966	-56.4		29	13,166	-60.4		22	13,042	-59.2		27	13,026	-59.7		24	13,200	-60.0		24	13,125	-59.6	
150	21	14,154	-65.3		27	13,938	-58.1		29	14,116	-64.5		22	14,002	-61.4		26	13,990	-62.4		24	14,151	-64.1		21	14,095	-56.6	
125	19	15,247	-68.8		27	15,083	-58.9		29	15,224	-66.3		22	15,132	-62.3		25	15,104	-63.3		23	15,260	-67.8		19	15,215	-64.5	
100	16	16,580	-69.5		27	16,483	-58.8		29	16,577	-66.0		20	16,509	-62.2		25	16,474	-62.7		19	16,625	-67.0		18	16,583	-63.7	
80	15	17,921	-65.6		26	17,884	-58.1		25	17,939	-63.0		20	17,892	-60.7		24	17,854	-60.7		15	17,989	-64.8		15	17,974	-62.7	
60	13	19,701	-60.1		25	19,700	-56.3		23	19,721	-59.5		19	19,699	-57.1		24	19,654	-57.9		14	19,761	-59.6		13	19,773	-57.5	
50	12	20,846	-57.3		24	20,859	-54.9		23	20,869	-57.0		19	20,856	-55.6		22	20,804	-56.4		13	20,917	-56.0		13	20,929	-55.9	
40	7	22,253	-55.0		22	22,293	-52.8		23	22,290	-54.0		17	22,282	-54.0		20	22,214	-55.1		11	22,359	-53.5		13	22,355	-53.4	
30					17	24,165	-50.7		18	24,159	-50.8		13	24,118	-51.9		17	24,051	-52.6		7	24,221	-51.7		8	24,220	-51.4	

Standard pressure surface (mb.)	PHOENIX, ARIZ. (968 MB.)				PITTSBURGH, PA. (972 MB.)				PORTLAND, ME. (1011 MB.)				RAPID CITY, S. DAK. (900 MB.)				ST. CLOUD, MINN. (974 MB.)				SAN ANTONIO, TEX. (984 MB.)				SAN JUAN, P. R. (1015 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	341	33.3	21	29	375	19.7	75	30	20	13.9	89	29	966	17.3	67	30	316	18.9	74	30	243	27.8	60	30	19	25.7	84
1000	30	39			29	124			30	109	16.1	78	29	54			30	82			30	100			30	150	24.9	80
950	30	508	32.7	17	29	576	19.7	68	30	548	15.5	71	29	506			30	530	19.2	63	30	561	25.7	63	30	601	21.8	80
900	30	988	28.8	17	29	1,034	17.0	69	30	1,003	13.2	71	29	969	17.6	68	30	991	17.1	63	30	1,031	22.4	68	30	1,067	19.0	77
850	30	1,492	24.5	19	29	1,519	14.5	63	30	1,481	10.3	72	29	1,458	17.3	53	30	1,476	14.1	64	30	1,527	19.5	65	30	1,557	16.3	72
800	30	2,017	19.9	22	29	2,030	11.7	58	30	1,983	7.5	69	29	1,972	14.3	53	30	1,987	11.7	57	30	2,047	16.6	61	30	2,072	14.1	61
750	30	2,573	15.2	25	29	2,574	9.0	54	30	2,516	5.0	61	29	2,519	10.8	52	30	2,530	8.1	61	30	2,603	13.9	52	30	2,618	11.3	54
700	30	3,148	10.6	28	29	3,136	5.7	54	30	3,073	1.9	57	29	3,086	7.0	48	30	3,091	5.2	52	30	3,174	11.2	42	30	3,188	8.1	49
650	30	3,764	6.3	26	29	3,742	2.3	54	30	3,672	- 1.0	50	29	3,692	2.6	47	30	3,696	1.8	47	30	3,797	7.6	38	30	3,801	4.5	48
600	30	4,411	1.9	27	29	4,381	- 1.6	52	30	4,303	- 4.8	50	29	4,333	- 1.9	52	30	4,333	- 2.3	44	29	4,443	3.5	39	30	4,444	.8	45
550	30	5,107	- 2.9	29	29	5,068	- 5.8	46	30	4,985	- 9.2	51	29	5,017	- 7.0	53	30	5,019	- 7.2	43	29	5,146	- 1.0	35	30	5,140	- 3.2	40
500	30	5,855	- 8.0		29	5,809	-10.3	36	30	5,712	-14.0	44	29	5,755	-11.9	47	30	5,755	-11.9	38	29	5,897	- 6.1	31	30	5,886	- 7.3	40
450	30	6,675	-13.6		29	6,619	-15.5		30	6,510	-19.3	40	29	6,562	-17.4	41	29	6,561	-16.9		28	6,724	-11.4		30	6,709	-12.5	38
400	30	7,550	-19.9		29	7,492	-21.9	34	30	7,370	-25.3	41	29	7,425	-23.6	37	29	7,425	-23.2		28	7,605	-17.7		30	7,590	-18.4	39
350	30	8,525	-27.6		29	8,460	-29.2		30	8,324	-32.4	37	29	8,386	-30.7	37	27	8,381	-31.0		28	8,588	-25.1		30	8,572	-25.4	37
300	30	9,614	-36.1		27	9,539	-37.5		29	9,388	-39.9		29	9,462	-38.6		27	9,456	-39.2		28	9,688	-33.7		30	9,670	-33.9	
250	30	10,853	-45.7		24	10,770	-46.4		29	10,611	-47.4		29	10,688	-47.5		27	10,681	-47.9		26	10,939	-43.3		30	10,919	-44.1	
200	30	12,305	-56.0		24	12,221	-56.0		29	12,063	-53.6		29	12,134	-55.4		27	12,127	-55.2		25	12,405	-54.3		30	12,374	-56.3	
175	30	13,145	-60.8		23	13,057	-60.4		29	12,916	-55.8		29	12,980	-57.6		27	12,974	-57.5		25	13,249	-60.1		30	13,208	-62.9	
150	30	14,093	-64.9		23	14,010	-63.1		29	13,893	-57.1		27	13,932	-58.1		27	13,944	-58.7		24	14,195	-65.8		30	14,140	-69.5	
125	28	15,193	-66.5		21	15,123	-62.2		29	15,045	-56.9		27	15,076	-58.9		27	15,088	-59.1		23	15,288	-70.0		28	15,213	-73.4	
100	26	16,532	-66.3		14	16,499	-61.5		27	16,451	-58.0		27	16,472	-59.6		24	16,484	-58.8		20	16,607	-71.1		23	16,517	-72.4	
80	26	17,889	-63.9		5	17,881	-60.1		24	17,860	-57.5		25	17,865	-58.7		24	17,886	-57.7		17	17,934	-67.7		20	17,835	-70.8	
60	24	19,670	-58.7						21	19,685	-55.7		24	19,681	-56.0		23	19,711	-55.8		14	19,686	-62.3		18	19,560	-65.1	
50	22	20,819	-56.7						21	20,848	-54.3		19	20,844	-54.7		22	20,872	-54.1		13	20,822	-58.6		18	20,678	-61.8	
40	21	22,243	-54.2						20	22,280	-52.4		18	22,277	-53.3		21	22,303	-52.9		12	22,226	-54.9		17	22,067	-58.5	
30	15	24,108	-51.3						13	24,137	-50.4		13	24,129	-52.2		15	24,174	-50.9		7	24,079	-50.5		11	23,893	-54.9	
20									6	26,772	-46.5																	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

JUNE 1954

Standard pressure surface (mb.)	SANTA MARIA, CALIF. (1005 MB.)				S. STE. MARIE, MICH. (987 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	71	14.4	75	30	221	13.8	85
1000	30	112	13.6	76	30	111		
950	30	554	16.7	58	30	551	15.3	66
900	30	1,009	18.5	36	30	1,008	15.2	63
850	30	1,496	16.3	31	30	1,490	12.5	63
800	30	2,009	13.3	29	30	1,996	9.7	62
750	30	2,553	11.0	23	30	2,536	7.0	57
700	30	3,121	8.0	23	30	3,094	4.3	53
650	30	3,731	4.8		30	3,695	.6	50
600	30	4,376	1.0		30	4,332	- 3.2	50
550	30	5,071	- 3.4		30	5,015	- 7.2	46
500	30	5,816	- 8.5		30	5,752	-11.7	43
450	30	6,632	-14.3		29	6,557	-17.3	39
400	30	7,507	-20.8		29	7,421	-23.0	30
350	30	8,478	-28.3		29	8,385	-30.3	
300	30	9,563	-36.9		29	9,462	-38.7	
250	30	10,797	-46.6		29	10,688	-47.6	
200	30	12,245	-55.8		23	12,175	-55.6	
175	30	13,086	-59.7		19	13,025	-59.2	
150	30	14,040	-63.0		13	13,984	-59.8	
125	30	15,154	-65.0		10	15,124	-58.5	
100	30	16,510	-64.9		6	16,536	-57.9	
80	30	17,875	-62.7					
60	30	19,662	-58.0					
50	30	20,811	-56.9					
40	29	22,233	-54.7					
30	23	24,092	-52.5					
20	5	26,683	-49.3					

Standard pressure surface (mb.)	SPOKANE, WASH. (929 MB.)				SWAN ISLAND, W. I. (1012 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	722	16.3	47	30	10	26.7	84
1000	30	85			30	112	26.1	84
950	30	526			30	567	23.0	83
900	30	986	14.2	47	30	1,034	20.1	81
850	30	1,465	10.2	52	30	1,526	17.6	73
800	30	1,966	6.1	57	30	2,043	15.1	64
750	30	2,492	2.0	57	30	2,594	12.3	58
700	30	3,044	- 1.6	55	30	3,163	9.2	55
650	30	3,633	- 5.5	58	30	3,780	5.4	58
600	30	4,254	- 9.6	58	30	4,424	1.7	60
550	30	4,920	-13.7	56	29	5,119	- 2.2	56
500	30	5,639	-18.1	49	28	5,872	- 6.4	54
450	30	6,420	-23.1	47	27	6,699	-11.3	53
400	30	7,271	-20.9	50	26	7,586	-16.6	53
350	30	8,212	-35.8		26	8,575	-23.6	51
300	30	9,266	-42.9		23	9,683	-31.7	
250	30	10,475	-49.3		20	10,943	-41.9	
200	30	11,925	-51.6		19	12,414	-54.0	
175	30	12,792	-51.1		18	13,257	-61.0	
150	29	13,800	-51.2		16	14,197	-68.1	
125	28	14,986	-52.2		11	15,267	-73.8	
100	28	16,425	-53.2		6	16,563	-73.4	
80	21	17,848	-53.0					
60	15	19,704	-52.0					
50	10	20,909	-51.4					
40	9	22,375	-50.2					
30	6	24,278	-48.5					
20								

Standard pressure surface (mb.)	TACUBAYA, MEXICO (772 MB.)				TAMPA, FLA. (1015 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	27	2,306	17.9	67	30	7	24.8	86
1000	27	34			30	139	24.8	81
950	27	497			30	596	22.9	74
900	27	977			30	1,060	20.4	72
850	27	1,475			30	1,552	17.5	73
800	27	2,004			30	2,068	14.5	66
750	27	2,560	15.9	67	30	2,617	11.3	60
700	27	3,140	11.2	72	30	3,184	8.1	52
650	27	3,758	6.6	77	30	3,800	4.5	50
600	27	4,408	2.3	00	29	4,439	.7	46
550	26	5,108	- 1.9	77	29	5,138	- 3.5	41
500	24	5,859	- 6.3	75	28	5,879	- 7.9	
450	23	6,685	-10.8	64	27	6,706	-12.9	
400	22	7,572	-16.6		27	7,578	-19.0	
350	19	8,563	-23.3		27	8,558	-26.1	
300	17	9,673	-31.6		27	9,653	-34.4	
250	15	10,935	-41.9		27	10,901	-44.1	
200	15	12,409	-54.2		27	12,360	-55.1	
175	12	13,244	-61.0		27	13,202	-60.4	
150	10	14,185	-68.5		27	14,151	-64.9	
125	7	15,272	-74.9		27	15,252	-68.3	
100	5	16,539	-77.6		26	16,579	-70.4	
80	5	17,826	-73.0		25	17,908	-67.4	
60					22	19,669	-61.7	
50					21	20,806	-59.2	
40					19	22,209	-56.3	
30					17	24,056	-52.0	
20								

Standard pressure surface (mb.)	TATOOSH ISLAND, WASH. (1012 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	31	11.7	82
1000	30	130	11.2	81
950	30	559	8.8	76
900	30	1,003	6.1	75
850	30	1,469	3.4	74
800	30	1,959	1.4	64
750	30	2,482	- 1.0	56
700	30	3,025	- 3.7	52
650	30	3,614	- 6.9	53
600	30	4,227	-10.4	51
550	30	4,895	-14.8	40
500	30	5,606	-19.4	47
450	30	6,388	-24.6	45
400	30	7,230	-30.2	44
350	30	8,165	-37.3	
300	30	9,213	-44.1	
250	30	10,418	-50.1	
200	30	11,861	-52.0	
175	30	12,728	-50.7	
150	30	13,732	-50.3	
125	30	14,919	-51.2	
100	28	16,371	-51.7	
80	28	17,817	-51.9	
60	28	19,682	-51.5	
50	28	20,866	-51,2	
40	25	22,315	-50,7	
30	13	24,209	-49.4	
20				

Standard pressure surface (mb.)	VERACRUZ, MEXICO (1009 MB.)				WASHINGTON, D. C. (1005 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	18	13	27.7	81	30	88	20.8	66
1000	18	91	27.2	81	30	129	21.6	62
950	18	541	24.0	77	30	580	20.9	59
900	18	1,017	21.4	73	30	1,040	17.7	63
850	18	1,511	18.6	70	30	1,527	14.9	59
800	18	2,029	15.4	71	30	2,038	11.5	62
750	18	2,584	12.3	69	30	2,581	8.5	56
700	18	3,150	9.0	62	30	3,142	5.6	46
650	18	3,770	6.1	53	30	3,750	2.3	42
600	17	4,415	2.5		30	4,387	- 1.5	41
550	17	5,114	- 1.1		30	5,076	- 5.5	33
500	17	5,870	- 5.1		30	5,816	-10.0	
450	17	6,705	-10.0		30	6,633	-15.2	
400	17	7,590	-15.6		30	7,501	-21.4	
350	15	8,585	-22.4		30	8,471	-28.7	
300	14	9,697	-30.8		30	9,555	-37.0	
250	14	10,964	-41.1		29	10,791	-46.2	
200	14	12,441	-53.7		29	12,241	-56.0	
175	14	13,284	-60.8		29	13,081	-60.5	
150	13	14,230	-67.6		29	14,033	-63.0	
125	10	15,309	-73.5		29	15,155	-62.6	
100	5	16,590	-76.8		27	16,528	-62.3	
80					26	17,905	-60.9	
60					23	19,703	-57.5	
50					23	20,859	-55.5	
40					22	22,288	-53.5	
30					16	24,166	-50.6	

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20 *Air Force Data for February, 1954

Standard pressure surface (mb.)	DENVER, COLO. (832 MB.) Number of observations	Dynamic height	Temperature	Relative humidity	FT. WORTH, TEX. (996 MB.) Number of observations	Dynamic height	Temperature	Relative humidity	OGDEN, UTAH (856 MB.) Number of observations	Dynamic height	Temperature	Relative humidity	RANTOUL, ILL. (986 MB.) Number of observations	Dynamic height	Temperature	Relative humidity	ROME, N. Y. (994 MB.) Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	28	1,661	5.7	33	27	178	14.2	54	17	1,450	2.9	59	28	227	2.8	78	28	146	- 1.6	80
1,000--	28	118			27	141	10.6		17	166			28	115			28	105	- 3.7	
950----	28	555			27	577	15.0	39	17	595			28	532	3.0	69	28	515	- 1.6	76
900----	28	1,011			27	1,032	12.2	40	17	1,041			28	968	1.1	64	28	944	- 3.2	75
850----	28	1,485			27	1,509	9.9	34	17	1,503	3.5		28	1,426	- .6	57	28	1,395	- 5.1	78
800----	28	1.987	7.6	29	27	2,009	7.2	28	17	1,995	1.9	50	28	1,909	- 2.6	53	28	1,870	- 7.0	76
750----	28	2,520	3.7	31	27	2,543	4.0	30	17	2,516	- 2.2	56	28	2,428	- 4.4	50	28	2,376	- 8.8	68
700----	28	3,071	- .8	36	27	3,094	.5	29	17	3,056	- 5.8	63	28	2,960	- 6.4	47	28	2,902	-11.8	65
650----	28	3,659	- 5.7	40	27	3,691	- 2.9		17	3,633	- 9.8	62	28	3,543	- 9.8	46	28	3,471	-14.6	58
600----	28	4,279	-10.2	39	27	4,315	- 6.9		17	4,246	-13.5	61	28	4,150	-13.4	46	28	4,069	-18.0	54
550----	28	4.943	-14.9	39	27	4,989	-11.7		17	4,905	-17.0	54	28	4,808	-17.7	46	28	4,716	-22.2	54
500----	28	5,657	-19.7	39	27	5,710	-17.1		17	5,613	-21.8		28	5,513	-22.6	47	28	5,407	-26.6	53
450----	28	6,434	-25.5		27	6,498	-23.1		17	6,382	-26.8		28	6,283	-28.4		20	6,165	-31.8	
400----	28	7,273	-32.0		27	7,344	-29.4		17	7,219	-32.9		28	7,111	-34.6		28	6,982	-37.5	
350----	27	8,201	-39.7		27	8,283	-36.7		17	8,143	-40.1		28	8,029	-41.3		28	7,891	-43.4	
300----	26	9,241	-47.7		27	9,333	-44.7		17	9,176	-48.2		28	9,059	-48.1		28	8,912	-49.8	
250----	26	10,423	-55.0		27	10,530	-52.8		17	10,352	-56.4		28	10,243	-53.6		26	10,101	-54.0	
200----	26	11,830	-59.2		27	11,948	-58.1		16	11,751	-59.9		23	11,685	-57.0		21	11,514	-54.3	
175----	26	12,664	-59.6		22	12,791	-57.7		16	12,585	-59.1		21	12,529	-54.7		18	12,366	-52.9	
150----	24	13,633	-59.3		20	13,767	-59.4		15	13,543	-58.4		19	13,522	-55.3		15	13,341	-53.0	
125----	20	14,765	-60.7		17	14,897	-63.1		13	14,674	-58.9		16	14,674	-57.2		12	14,495	-54.4	
100----	13	16,120	-60.9		7	16,253	-65.7		10	16,081	-59.7		10	16,073	-59.7		5	15,966	-57.0	
80-----	6	17,509	-61.8						8	17,467	-59.4									

* March data for the above Air Force stations will be included in the July issue of this publication.

Note: All observations scheduled at 0300, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Table 21

JUNE 1954

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	168	5.3	30	232	3.7	30	328	1.6	29	220	1.7	30	318	2.9	30	131	8.8
500	--	---	----	--	---	----	--	---	----	--	---	----	--	---	----	30	133	9.8
1,000	30	166	6.3	--	---	----	--	---	----	29	236	1.7	30	320	2.9	26	140	8.2
1,500	30	171	6.2	--	---	----	30	292	1.9	28	231	3.2	30	304	2.8	24	148	6.8
2,000	26	178	6.8	30	228	4.3	28	261	3.2	25	241	5.7	29	284	3.3	20	139	6.0
2,500	24	184	5.6	29	221	3.6	24	260	5.5	22	245	8.0	28	260	4.4	19	125	5.7
3,000	23	177	4.4	29	223	4.2	23	259	8.4	19	248	10.0	27	257	5.9	19	129	4.5
4,000	22	192	3.1	28	232	5.3	18	258	12.7	18	257	11.5	22	246	9.6	15	133	2.3
5,000	17	235	2.3	25	251	7.9	13	257	15.0	15	261	15.6	22	245	14.2	11	50	2.2
6,000	17	230	3.5	22	248	9.2	13	256	15.9	13	273	17.0	21	255	16.8	11	26	2.6
8,000				18	253	11.7				12	267	23.0	13	270	21.2			
10,000				16	259	12.6												
12,000				11	267	17.1												
14,000																		
16,000																		

Altitude (meters) m.s.l.	* Buffalo, N. Y. (182 m.)			Burlington, Vt. (100 m.)			Charleston, S. C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)			Ely, Nev. (1,910 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	247	1.8	30	319	0.9	29	165	2.9	29	247	2.4	30	218	2.9	30	201	3.9
500	30	260	3.6	30	297	1.9	29	176	2.7	29	243	3.0	--	---	----	--	---	----
1,000	30	262	5.4	27	291	2.6	29	288	1.2	28	253	3.5	--	---	----	--	---	----
1,500	30	274	6.4	22	289	3.4	24	319	2.7	27	261	3.5	30	221	3.0	--	---	----
2,000	30	278	7.6	20	291	4.6	24	317	3.8	25	282	4.1	30	214	3.0	30	202	4.1
2,500	30	292	7.9	19	307	6.2	24	319	4.4	20	303	4.5	29	220	2.3	30	211	4.6
3,000	30	302	9.0	14	325	7.7	24	323	4.7	20	305	5.5	29	224	2.8	29	220	4.5
4,000	30	300	10.9	13	321	9.6	22	318	4.4	16	308	6.3	26	237	4.2	23	230	5.4
5,000	30	301	13.3	11	337	10.7	20	309	5.8	14	320	7.8	23	236	6.2	23	248	9.2
6,000	30	305	14.0				19	299	5.6	12	318	7.1	23	244	8.2	21	253	13.3
8,000	29	305	16.7				12	313	4.8				18	251	12.0	10	257	17.0
10,000	28	306	18.3										15	260	15.2			
12,000	25	311	17.3										15	257	19.0			
14,000	24	291	13.2										13	252	19.7			
16,000	20	298	8.3										10	239	11.4			

Altitude (meters) m.s.l.	Grand Junction, Colo. (1,475 m.)			Green Bay, Wis. (210 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Little Rock, Ark. (88 m.)		
Surface	30	244	2.6	30	218	1.2	29	304	1.4	27	261	2.8	30	112	3.0	29	179	1.9
500	--	---	----	30	242	1.9	29	303	1.9	--	---	----	29	118	2.6	29	185	2.2
1,000	--	---	----	28	246	4.9	29	294	2.2	27	258	3.8	29	172	.8	28	198	2.7
1,500	30	245	2.6	25	264	6.1	27	287	2.9	25	266	6.1	28	276	1.3	27	220	3.1
2,000	30	258	3.9	23	272	6.7	24	302	3.8	21	263	7.4	25	286	2.3	25	242	3.7
2,500	30	246	4.1	19	275	9.8	23	312	5.0	20	255	9.1	22	317	2.7	23	239	3.6
3,000	29	228	5.1	17	282	9.2	21	319	6.5	15	259	11.7	19	336	3.1	21	237	3.6
4,000	28	222	7.6	16	286	10.7	19	309	7.8				17	296	3.0	17	255	3.8
5,000	27	234	11.1	14	288	13.2	17	327	9.8				14	300	2.6	10	279	6.9
6,000	21	239	12.3	13	284	15.7	17	326	9.1				12	290	3.0			
8,000	15	253	12.9	10	287	17.2	14	319	10.0				10	298	4.0			
10,000	11	266	14.0				10	332	9.5									
12,000																		

Altitude (meters) m.s.l.	Medford, Ore. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			Oakland, Calif. (8 m.)			Omaha, Nebr. (306 m.)		
Surface	29	317	1.8	30	155	2.2	30	206	2.7	30	278	1.8	29	268	5.9	30	182	3.7
500	29	312	2.2	30	169	2.4	30	205	1.3	30	270	2.3	29	277	5.9	30	188	4.4
1,000	29	297	2.7	30	204	1.7	28	131	.8	30	269	1.9	27	290	4.2	26	206	4.3
1,500	28	258	2.4	29	246	1.3	22	33	1.4	29	263	1.9	27	291	4.1	22	223	5.9
2,000	26	234	2.7	29	260	1.9	15	354	1.6	26	297	2.0	24	300	4.6	20	241	6.8
2,500	18	234	3.8	26	262	.9	11	38	.4	25	306	2.9	24	297	4.5	18	251	7.2
3,000	15	266	4.9	24	268	.6	10	87	.3	25	304	3.3	24	292	4.7	17	250	8.3
4,000	12	268	9.8	20	194	1.3				25	299	4.0	23	285	6.7	13	270	9.6
5,000	12	268	14.7	15	155	.2				22	302	5.5	23	275	10.4	12	277	11.5
6,000	11	268	17.0	15	312	1.4				22	305	5.4	22	273	14.8	12	275	12.9
8,000										19	317	4.0	12	268	15.7			
10,000										16	341	5.1						
12,000										12	356	5.6						

Altitude (meters) m.s.l.	Phoenix, Ariz. (345 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			San Antonio, Tex. (240 m.)		
Surface	30	242	1.7	29	225	0.3	30	188	0.6	30	153	5.2
500	30	242	1.9	--	---	----	30	178	1.6	30	148	6.4
1,000	30	242	2.2	29	237	.3	29	184	2.5	30	144	6.9
1,500	30	236	2.6	28	164	1.6	24	217	4.4	30	147	6.4
2,000	29	215	3.4	26	206	4.1	22	230	5.9	26	155	6.1
2,500	28	216	4.6	22	233	5.6	20	250	7.2	21	160	6.0
3,000	28	223	6.4	22	244	8.6	16	249	10.2	21	161	5.1
4,000	28	229	7.1	18	257	10.7	15	257	12.4	19	172	4.1
5,000	28	242	7.9	17	263	13.8	12	273	14.8	14	196	3.8
6,000	27	245	9.1	13	264	15.7	10	281	14.3	11	199	2.2
8,000	18	255	9.6	12	270	18.9	10	279	18.0			
10,000												
12,000												
14,000												
16,000												

Altitude (meters) m.s.l.	San Diego, Calif. (13 m.)			** Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (725 m.)			# Washington, D. C. (88 m.)		
Surface	30	247	3.6	30	287	0.9	30	209	3.1	30	270	1.5
500	26	261	2.3	29	305	1.6	--	---	----	30	280	2.8
1,000	21	253	.9	29	290	2.8	30	214	4.0	30	273	3.2
1,500	20	288	1.2	29	284	4.4	29	219	4.4	30	287	4.1
2,000	20	263	1.6	29	283	5.8	25	222	5.2	30	300	5.5
2,500	18	257	3.5	29	290	7.1	22	224	5.3	30	308	7.2
3,000	17	259	4.9	29	283	8.9	17	232	6.0	30	314	8.5
4,000	17	244	7.0	28	285	12.1	10	242	9.3	30	313	8.9
5,000	16	246	9.7	28	284	13.5				30	306	11.2
6,000	15	244	11.5	29	286	15.0				30	304	12.6
8,000	11	255	14.9	29	289	17.7				30	299	15.8
10,000				27	288	21.7				30	303	17.6
12,000				26	283	24.7				29	309	19.4
14,000				24	280	17.5				30	306	15.8
16,000				22	285	7.5				28	312	9.1

* Rawin Data (Cont'd)
18,000 m., 18 obs. 312 dir., 2.2 speed
20,000 m., 14 obs. 82 dir., .7 speed
22,000 m., 13 obs. 99 dir., 2.9 speed
24,000 m., 11 obs. 81 dir., 3.9 speed

** Rawin Data (Cont'd)
18,000 m., 21 obs. 315 dir., 2.3 speed
20,000 m., 15 obs. 104 dir., 2.3 speed
22,000 m., 12 obs. 93 dir., 3.5 speed

Rawin Data (Cont'd)
18,000 m., 25 obs., 356 dir., 2.2 speed
20,000 m., 24 obs., 82 dir., 3.8 speed
22,000 m., 22 obs., 87 dir., 4.3 speed
24,000 m., 20 obs., 75 dir., 7.9 speed
26,000 m., 13 obs., 87 dir., 8.9 speed

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

RAWIN DATA

Average monthly resultant winds

Table 22

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Buffalo, N.Y. (182 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S. C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N. C. (275 m.)			Hatteras, N. C. (3 m.)			Int. Falls, Minn. (358 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	174	1.7	27	94	1.5	30	117	6.5	30	216	0.9	30	199	1.6	30	8	1.1	31	171	1.2	30	160	2.2	30	317	0.8	30	17	0.3	30	179	1.7	30	210	0.8
500	--	---	----	--	---	----	30	136	10.2	30	265	4.4	28	156	.8	30	80	1.4	30	200	3.5	30	186	5.4	--	---	----	30	297	.6	28	219	2.6	30	213	1.3
1,000	--	---	----	27	262	.1	30	135	9.5	30	274	6.4	28	85	2.0	30	125	1.5	30	251	1.4	30	207	6.1	--	---	----	30	284	1.8	29	277	2.1	30	227	3.6
1,500	--	---	----	27	242	2.6	30	139	7.7	30	287	7.5	27	71	2.8	30	172	1.4	30	333	1.6	30	222	6.0	30	307	.9	30	292	2.8	29	310	3.1	28	238	4.5
2,000	30	224	4.9	27	261	4.7	30	141	6.3	30	294	7.6	27	78	2.9	30	243	1.8	29	341	1.8	29	237	6.6	30	246	3.5	30	294	3.4	30	305	3.7	28	241	5.7
2,500	30	231	6.2	26	255	6.1	30	141	4.8	30	302	8.0	28	85	2.9	30	259	2.4	29	340	2.3	28	255	6.5	30	240	5.1	30	303	3.6	30	309	5.1	28	250	6.9
3,000	30	236	6.6	25	261	7.9	30	140	2.7	30	305	8.8	28	68	3.1	29	287	2.0	29	328	2.6	28	259	6.1	30	230	5.9	30	315	4.5	30	310	5.0	28	250	8.6
4,000	30	241	6.7	24	261	11.1	30	128	1.1	30	308	11.3	29	50	2.0	28	294	2.8	29	329	3.4	27	263	6.2	30	220	7.7	29	324	5.4	30	313	6.5	25	258	10.7
5,000	30	245	6.9	24	263	14.1	30	59	1.0	29	305	12.2	28	23	1.8	27	299	3.9	29	333	4.2	27	270	7.3	30	226	10.2	27	317	6.4	30	306	7.9	25	256	12.7
6,000	29	258	8.3	22	256	14.5	30	13	1.8	29	303	12.5	27	4	1.6	27	287	5.4	29	333	4.4	26	260	8.3	29	247	12.9	26	314	6.9	30	310	8.5	25	258	15.1
8,000	24	272	9.0	16	254	16.5	29	340	4.1	28	303	15.9	28	4	2.3	26	290	7.6	26	306	5.1	26	250	11.2	23	253	14.4	22	309	5.3	28	314	10.4	19	262	15.7
10,000	20	282	8.2	12	257	18.3	29	312	8.2	26	305	18.6	27	349	4.1	24	300	9.1	25	304	5.1	25	255	12.0	15	260	11.9	19	298	4.0	25	317	10.0	12	250	15.6
12,000	18	283	7.8				27	310	12.3	24	300	21.9	29	357	6.0	20	299	12.7	23	303	6.8	25	262	13.6	12	246	11.9	16	309	4.8	23	316	9.7	10	247	23.4
14,000	17	274	9.7				26	305	9.8	19	296	18.0	25	325	5.1	14	341	6.0	23	295	8.3	24	254	12.4	10	237	7.9	15	316	7.1	22	309	11.0			
16,000							24	359	2.8	10	299	10.2	22	344	4.7	14	19	4.2	23	309	4.8	22	269	6.9				15	335	7.4	19	330	5.3			
18,000							20	84	6.2				18	71	4.3	14	1	2.3	18	71	4.1	21	88	2.1				12	50	4.4	15	32	4.6			
20,000							19	85	11.7				17	68	8.6	13	58	3.8	17	75	6.5	16	89	5.1				12	72	6.0	12	64	4.9			
22,000													10	71	13.5	12	71	5.8	15	74	8.9	12	78	6.7				11	79	7.6	10	87	7.9			
24,000																10	88	6.4	12	100	11.6															

Altitude (meters) m.s.l.	Little Rock, Ark. (80 m.)			Medford, Ore. (401 m.)			Miami, Fla. (12 m.)			Midland, Tex. (871 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			St. Cloud, Minn. (318 m.)			San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	177	1.8	30	318	3.1	30	144	1.5	30	140	4.2	29	239	1.7	30	211	0.8	30	266	4.4	27	159	4.1	30	31	2.1	29	102	0.7	30	150	6.6	30	115	3.5
500	29	194	5.3	30	315	3.8	30	175	3.9	--	---	----	28	260	5.6	30	223	1.3	30	291	5.9	26	160	5.9	--	---	----	29	130	1.4	30	138	9.9	30	97	7.9
1,000	29	205	5.2	30	312	4.5	30	185	3.5	30	145	6.3	27	279	6.6	30	241	2.2	30	296	6.8	25	173	9.6	30	35	2.2	29	202	2.5	30	147	9.5	30	107	8.3
1,500	29	205	3.8	30	294	3.5	30	190	2.7	30	158	10.3	27	289	5.8	30	253	2.7	30	299	5.2	23	194	7.7	30	140	1.2	29	235	3.5	30	153	7.0	30	106	7.9
2,000	29	219	3.0	30	259	3.6	30	190	1.9	30	169	8.0	28	284	4.7	30	267	2.1	30	297	4.6	23	212	5.8	30	218	3.4	29	252	5.2	30	162	5.9	30	102	7.8
2,500	29	214	2.4	30	250	4.7	30	190	1.9	30	181	4.8	29	290	5.0	30	289	2.6	30	295	5.6	23	220	4.8	30	242	5.7	29	253	7.3	30	159	4.7	30	105	6.7
3,000	29	220	2.4	30	251	6.2	30	199	.9	30	198	2.6	28	301	5.9	30	307	2.6	30	291	6.2	23	225	4.4	30	255	7.9	29	254	9.4	30	162	3.3	30	101	6.6
4,000	26	269	1.1	30	256	8.7	29	248	.9	29	274	2.4	28	305	8.9	30	304	4.2	29	287	7.7	25	266	3.9	30	260	12.3	27	259	10.2	30	178	1.4	30	93	5.3
5,000	25	16	1.7	29	261	11.1	29	291	1.5	29	282	4.5	26	305	9.7	30	311	5.2	29	288	11.7	22	281	1.6	28	257	14.9	27	260	10.8	29	270	1.6	30	79	3.3
6,000	22	37	1.1	29	264	13.7	29	300	2.0	29	285	4.3	26	308	11.3	30	308	5.6	25	280	11.3	23	257	2.8	28	253	17.5	26	265	13.2	28	277	2.3	30	104	1.9
8,000	20	277	1.2	22	265	14.3	29	257	3.6	28	286	7.4	23	301	13.2	27	302	5.2	23	276	13.7	23	249	4.0	25	253	19.6	25	265	16.3	28	284	3.7	30	255	.1
10,000	19	333	2.1	17	251	17.5	29	248	7.1	25	281	7.7	18	299	16.6	25	296	4.8	19	270	16.7	22	257	6.4	20	258	19.4	19	245	17.9	26	278	7.3	30	272	3.3
12,000	19	312	3.8	10	242	18.1	29	228	8.3	19	263	12.0	11	313	11.2	23	306	5.6	13	277	14.0	21	273	7.0	13	229	22.3	14	255	18.1	24	280	12.5	30	282	7.2
14,000	17	290	5.1				29	274	8.6	16	269	12.9				22	292	7.4				21	269	8.4	10	244	18.9	13	252	11.1	18	283	13.7	30	300	11.4
16,000	12	293	5.2				20	9	3.8							20	325	4.9				18	289	2.1				12	260	6.6	14	274	7.6	26	270	3.5
18,000							18	79	7.3							19	44	2.9				14	90	4.2				16	266	2.6	11	131	2.5	20	96	4.9
20,000							17	79	10.0							17	78	7.1				13	84	7.2				18	114	2.2	10	73	9.4	17	80	14.9
22,000							15	83	14.3							17	81	9.1				11	85	8.9				17	87	5.9				16	87	19.7
24,000																14	90	10.8										11	103	8.0				11	88	22.8

Altitude (meters) m.s.l.	Santa Maria, Calif. (72 m.)			Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is., Wash. (33 m.)			Washington, D. C. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	260	4.4	29	337	0.5	30	220	2.6	30	240	2.7	30	180	1.2
500	30	319	5.0	29	336	1.1	--	---	----	29	240	3.5	30	261	3.2
1,000	30	340	5.4	29	275	2.0	29	231	4.0	28	243	3.5	30	286	4.7
1,500	30	1	4.0	29	270	2.9	29	242	5.1	28	232	3.4	30	295	5.0
2,000	30	4	3.8	29	279	3.8	29	243	5.8	27	229	4.4	30	309	5.6
2,500	30	322	4.7	29	293	5.1	29	247	6.1	26	232	4.6	30	312	5.8
3,000	30	310	5.7	29	302	7.1	29	252	7.0	27	238	5.7	30	313	6.3
4,000	30	292	8.4	29	302	8.9	30	251	8.0	26	251	6.7	30	315	7.4
5,000	30	283	9.0	28	299	11.7	30	250	9.7	26	259	8.0	30	319	9.8
6,000	30	285	11.5	28	298	13.2	30	250	11.6	25	255	10.6	30	314	12.0
8,000	26	275	11.0	28	295	16.0	30	248	17.6	22	254	13.7	30	305	16.2
10,000	26	270	11.9	28	290	21.0	29	246	19.5	21	265	17.0	29	307	18.2
12,000	22	262	13.1	23	282	24.8	29	244	19.6	16	259	10.4	29	310	19.2
14,000	18	257	12.6	11	287	24.3	27	231	12.6	14	257	6.5	29	311	16.8
16,000	17	263	7.6				27	229	7.9	13	232	3.5	28	315	9.2
18,000	16	204	1.7				21	228	3.2	13	181	2.0	25	24	3.2
20,000	16	85	4.2				12	104	3.0	13	142	1.8	23	70	5.7
22,000	16	92	8.8							12	78	3.9	22	81	6.5
24,000	13	89	9.9										15	88	10.7

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following Table 22 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

RAWIN DATA

Average monthly resultant winds

Table 22 *Air Force Data for February 1954

Altitude (meters) m.s.l.	Denver, Colo. (1,661 m.)			Ft. Worth, Tex. (178 m.)			Ogden, Utah (1,450 m.)			Rantoul, Ill. (227 m.)			Rome, N. Y. (146 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	28	280	0.7	28	226	1.1	19	154	1.3	28	200	1.1	28	315	0.9
500	--	---	----	27	240	4.5	--	---	----	26	278	5.3	27	265	4.0
1,000	--	---	----	27	251	5.7	--	---	----	26	281	5.8	27	275	7.5
1,500	--	---	----	20	276	5.7	18	159	1.8	26	291	7.6	28	280	9.1
2,000	27	309	5.3	28	289	7.7	17	208	4.2	27	287	9.0	28	281	9.6
2,500	26	314	6.0	28	293	9.2	17	249	5.1	27	285	11.4	28	202	10.1
3,000	26	314	7.0	27	300	9.3	17	276	7.0	28	291	11.8	28	277	10.5
4,000	26	320	10.3	27	292	11.2	19	301	10.8	28	289	15.6	28	275	12.4
5,000	27	315	12.9	27	289	11.4	19	301	16.4	28	292	19.0	28	274	14.9
6,000	27	321	14.1	27	291	12.6	19	301	19.4	28	289	22.0	28	275	16.1
8,000	27	319	14.7	27	284	16.9	19	299	22.6	27	291	25.5	28	273	20.0
10,000	26	297	17.7	27	278	20.9	16	300	28.7	27	292	28.4	22	280	21.3
12,000	25	307	18.3	25	272	27.6	15	295	25.5	22	283	23.5	14	292	20.7
14,000	22	297	17.0	19	273	25.8	14	290	23.8	17	280	20.0	12	279	22.7
16,000	14	296	12.9							11	301	25.2			

* March data for the above Air Force stations will be included in the July issue of this publication.

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following Table 22 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun. JUNE 1954

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
ALBUQUERQUE, N. MEX.									
	Air mass								
	4.08	3.26	2.44	1.63	*1.0	1.63	2.44	3.26	4.08
June									
1	0.95	----	----	----	----	----	----	----	----
2	.88	0.91	1.07	1.22	1.42	1.18	1.00	0.91	0.85
3	----	----	----	.37	----	.93	.71	.46	.37
5	.83	.91	1.03	1.19	1.36	.73	.34	.55	.50
6	.91	.99	1.11	1.26	1.45	----	----	----	----
7	.95	1.04	1.14	1.31	1.48	----	----	----	----
8	.84	.93	1.02	1.19	1.46	1.08	.76	.71	.67
9	----	1.01	1.09	1.27	1.43	1.04	.87	.68	.57
10	.89	.96	1.10	1.26	1.42	----	----	----	----
11	----	.90	1.05	----	1.41	1.22	1.07	.91	.80
12	.85	.94	1.08	1.25	1.37	1.15	.95	.83	.76
14	----	----	----	1.17	1.38	----	----	.87	.82
15	.77	.85	.99	1.15	1.38	----	----	----	----
16	.77	.90	1.02	1.18	1.43	1.23	1.06	.94	.87
17	.94	1.00	1.14	1.27	1.45	1.23	1.08	.95	.90
18	----	----	1.11	1.23	1.43	1.25	1.06	.94	.87
19	.31	.37	----	.86	1.31	----	----	.41	.34
20	.40	.52	.67	.87	1.32	----	----	----	----
21	.80	.87	.97	1.19	1.36	1.19	1.01	.87	.78
22	.37	.47	.69	----	----	----	----	----	----
23	.74	.82	.96	1.13	1.28	1.10	.98	.83	.77
24	.79	.86	.99	1.14	1.33	1.18	1.03	.90	.82
25	.52	.63	.82	1.01	1.30	----	----	----	----
27	----	----	----	----	----	1.15	1.01	.86	.78
28	.75	.82	.96	1.11	1.32	1.21	1.08	.94	.86
29	.89	.96	1.08	1.21	1.42	----	----	----	----
30	.70	.80	.95	1.11	1.27	----	----	----	----
Averages	.75	.85	1.02	1.13	1.39	1.11	.95	.80	.72
Departures	-.06	-.05	-.01	-.06	-.04	-.11	-.12	-.15	-.15
LINCOLN, NEBR.									
	Air mass								
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77
June									
7	----	----	----	----	1.33	1.08	0.84	0.60	0.48
22	----	----	----	----	1.32	1.08	.90	.77	.64
23	----	----	----	----	1.28	1.01	.82	.69	.58
25	----	----	----	----	1.23	.97	.77	.67	.56
26	----	----	----	----	1.21	.94	.73	.62	.54
Averages	----	----	----	----	1.27	1.02	.81	.67	.56
Departures	----	----	----	----	-.07	-.05	-.08	-.09	-.08
BOSTON, MASS.									
	Air mass								
	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96
NO DATA DURING JUNE 1954									

* Extrapolated

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
TABLE MOUNTAIN, CALIF.									
	Air mass								
	3.76	3.01	2.26	1.51	*1.0	1.51	2.26	3.01	3.76
June									
2	0.98	1.07	1.20	1.35	----	----	----	----	----
3	.95	1.03	1.15	1.31	----	----	----	----	----
5	1.10	1.18	1.29	1.42	----	----	----	----	----
16	----	----	----	1.36	----	----	----	----	----
17	1.07	1.15	1.25	1.38	----	----	----	----	----
18	1.09	1.17	1.27	1.38	----	----	----	----	----
19	1.10	1.18	1.28	1.40	----	----	----	----	----
21	----	----	----	1.34	----	----	----	----	----
28	----	----	----	1.39	----	----	----	----	----
29	----	----	----	1.39	----	----	----	----	----
Averages	1.05	1.13	1.24	1.37	----	----	----	----	----
Departures	-.03	-.04	-.04	-.03	----	----	----	----	----
BLUE HILL, MASS.									
	Air mass								
	4.86	3.89	2.92	1.94	*1.0	1.94	2.92	3.89	4.86
June									
3	0.78	0.88	1.00	1.16	----	----	----	----	----
6	.75	.83	.95	----	----	----	----	----	----
8	----	----	----	----	----	1.05	0.83	0.83	0.70
12	----	----	.84	1.07	----	----	----	----	----
16	----	----	----	----	----	1.20	1.02	.91	.80
17	.83	.92	----	----	----	1.22	1.05	.93	.84
18	.88	.98	1.10	1.20	----	1.13	----	----	----
19	.68	.80	.93	1.10	----	----	----	----	----
20	.70	.80	.93	1.09	----	.94	.69	.58	**.47
21	.56	.67	.80	**	----	----	----	----	**
22	.33	.39	.55	**.77	----	1.02	.92	.85	.78
24	----	----	----	----	----	----	1.01	.91	.81
25	----	----	.85	----	----	----	----	----	----
Averages	.69	.78	.89	1.07	----	1.09	.94	.84	.73
Departures	.03	.01	-.01	.01	----	-.04	-.07	-.11	-.10
	**Hazy								
MADISON, WIS.									
	Air mass								
	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81
June									
4	0.87	0.98	1.09	1.24	1.40	----	----	----	----
5	.89	1.00	1.12	1.29	1.48	----	1.06	0.95	0.85
8	----	----	----	----	1.44	1.17	.93	.80	.66
22	----	----	----	----	1.44	1.09	.79	.68	.57
23	.81	.90	1.05	1.21	1.40	----	----	----	----
27	----	----	----	----	1.39	1.16	1.12	.87	.75
20	----	.68	.83	.96	----	----	----	----	----
30	----	----	----	----	1.42	1.16	.94	.75	.65
Averages	.86	.89	1.02	1.18	1.42	1.15	.97	.81	.72

Langley is the unit used to denote one gram calorie per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

SOLAR RADIATION DATA

Table 31a Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date------------	4	5	6	7	8	9	10		11	12	13	14	15	16	17		18	19	20	21	22	23	24	
Langleys--------	164	116	170	159	166	181	173	161	169	190	179	105	76	178	215	159	215	195	194	200	197	125	193	189
Date------------	25	26	27	28	29	30	1																	
Langleys--------	176	124	185	147	134	161	171	157																

Table 31b Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date------------	4	5	6	7	8	9	10		11	12	13	14	15	16	17		18	19	20	21	22	23	24	
Langleys--------	153	77	354	247	184	283	315	231	169	538	238	135	70	191	403	249	473	388	335	357	381	138	335	344
Date------------	25	26	27	28	29	30	1																	
Langleys--------	366	114	426	152	131	170	242	229																

Table 31c Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date------------	4	5	6	7	8	9	10		11	12	13	14	15	16	17		18	19	20	21	22	23	24	
Langleys--------	173	93	150	202	175	201	220	174	184	250	212	94	55	246	245	184	242	239	240	248	245	132	247	228
Date------------	25	26	27	28	29	30	1																	
Langleys--------	250	150	245	175	147	156	175	186																

Table 31d Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date------------	4	5	6	7	8	9	10		11	12	13	14	15	16	17		18	19	20	21	22	23	24	
Langleys--------	279	225	138	250	441	218	267	260	405	522	378	144	80	569	559	380	488	420	307	377	509	133	544	397
Date------------	25	26	27	28	29	30	1																	
Langleys--------	397	172	375	289	199	305	215	279																

Table 31e Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date------------	4	5	6	7	8	9	10		11	12	13	14	15	16	17		18	19	20	21	22	23	24	
Langleys--------	266	112	220	253	248	323	304	247	299	158	293	168	97	164	114	185	170	160	221	239	176	189	192	192
Date------------	25	26	27	28	29	30	1																	
Langleys--------	164	---	---	256	234	268	---	231																

Note: Langley is the unit used to denote one gram calorie per square centimeter.

CORRECTIONS

	Month: May 1953
page 162: East Lansing	Solar Radiation departures should be as follows: week of 7-13, +3; 14-20, +21; 21-27, +35; 28-June 3, +76; and accumulative departure -4347. Accumulative departure for June -4543; July -5250; August -3976; September -3437; October -2898; November -2415; December -2401.
	Month: December 1953
page 394: Wake Island	Corrected data for this period and also for January through April 1, 1954, are listed on page 238.
	Month: January 1954
page 3: Montana	The lowest temperature should be -70°F at Rogers Pass on the 20th.
	Month: February 1954
page 27: General Summary	First column, fifth line, 1930 should read 1936.
	Month: March-April 1954
: Charts IX and X	Charts IX and X, Tracks of Anticyclones and Cyclones, for March 1954 were inadvertently interchanged with those for April 1954. The tracks printed in the March 1954 issue are those for April 1954; the March 1954 tracks appear in the April 1954 issue.

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.

	Aklavik, MacKenzie	Albrook Air Base Panama, C. Z.	Albuquerque, N.Mex.	Annette, Alaska	Apalachicola, Fla.	Astoria, Oreg.	Atlanta, Ga.	Barrow, Alaska	Bethel, Alaska	Bismark, N. Dak.	Blue Hill, Mass.	Boise, Idaho
1954												
June 4	649	313	763	315	628	514	651	502	516	738	323	494
June 5	815	491	835	523	766	532	815	762	389	573	208	391
June 6	637	417	786	586	761	207	798	541	574	178	323	351
June 7	457	353	859	353	752	378	788	759	394	111	430	724
June 8	(607)	544	840	588	734	160	787	758	589	795	429	466
June 9	775	529	843	373	738	206	737	646	366	575	412	342
June 10	394	389	845	369	714	372	684	641	589	170	486	139
Averages	(619)	434	824	444	728	338	752	658	488	449	373	415
Departures	---	---	---	---	---	---	---	---	---	---	-150	---
June 11	353	---	851	315	212	227	713	451	563	630	356	701
June 12	695	---	829	316	---	560	675	372	461	780	707	403
June 13	450	519	522	470	---	327	635	439	372	693	429	639
June 14	324	205	766	254	---	126	546	---	386	251	177	617
June 15	458	395	807	666	---	388	587	519	762	791	106	195
June 16	502	267	828	576	---	596	598	681	317	463	672	800
June 17	662	540	832	459	---	541	447	563	768	340	767	703
Averages	492	385	777	437	---	395	600	504	518	564	459	580
Departures	---	---	---	---	---	---	---	---	---	---	-49	---
June 18	669	363	823	463	---	639	263	607	610	760	747	737
June 19	802	181	745	385	---	112	728	757	657	516	745	548
June 20	783	440	748	179	---	282	787	274	487	274	711	746
June 21	768	404	819	101	---	746	788	314	244	706	665	795
June 22	648	400	673	240	---	544	716	390	505	777	703	737
June 23	186	285	791	669	---	569	772	---	609	679	241	630
June 24	267	387	813	593	---	723	794	---	663	(541)	665	749
Averages	589	351	773	376	---	516	693	468	539	(607)	640	706
Departures	---	---	---	---	---	---	---	---	---	---	88	---
June 25	417	386	705	578	---	312	639	522	695	670	677	743
June 26	537	234	428	173	---	162	744	591	626	765	316	244
June 27	727	518	793	209	---	365	755	---	748	---	682	676
June 28	566	508	814	270	---	730	777	553	615	725	379	795
June 29	647	490	823	251	---	575	---	700	---	(629)	263	786
June 30	713	297	701	239	---	134	---	645	591	---	326	234
July 1	636	257	767	712	---	385	---	696	543	374	362	757
Averages	606	384	719	347	---	380	729	618	636	(633)	429	605
Departures	---	---	---	---	---	---	---	---	---	---	-89	---
Accumulated Departures January 1 to July 1, 1954	---	---	---	---	---	---	---	---	---	---	---	---

	Boston, Mass.	Brownsville, Tex.	Canton Island, Pacific Area	Caribou, Me.	Charleston, S. C.	Columbia, Mo.	Davis, Calif.	Dodge City, Kans.	East Lansing, Mich.	East Wareham, Mass.	El Paso, Tex.	Ely, Nev.	Fairbanks, Alaska
1954													
June 4	303	462	(651)	301	654	802	693	736	191	509	746	575	724
June 5	172	654	(610)	220	746	617	636	688	550	(253)	719	429	637
June 6	305	664	(612)	330	705	705	748	771	655	---	778	803	(605)
June 7	421	560	618	242	659	602	596	808	362	(467)	806	693	686
June 8	335	715	636	373	696	657	589	632	403	382	805	403	526
June 9	433	672	662	331	682	237	342	751	535	705	812	---	652
June 10	583	742	623	765	641	733	713	718	416	583	792	---	706
Averages	365	639	(630)	366	683	622	617	729	444	(483)	780	581	(648)
Departures	---	---	---	---	---	---	-36	---	-22	-41	---	---	---
June 11	453	---	550	547	670	769	601	654	554	377	797	784	705
June 12	669	(693)	651	760	403	536	687	655	454	587	776	501	219
June 13	---	618	649	366	633	708	748	613	605	444	584	415	679
June 14	190	594	656	774	711	641	712	570	460	294	735	694	259
June 15	83	600	662	760	679	438	617	613	400	195	800	652	463
June 16	650	609	665	760	650	(749)	762	769	428	636	(791)	---	352
June 17	739	666	644	771	568	(611)	766	761	413	743	783	819	561
Averages	464	(630)	640	677	616	(636)	699	662	473	468	(752)	644	463
Departures	---	---	---	---	---	---	-18	---	38	-55	---	---	-49
June 18	695	500	631	739	422	(576)	755	752	365	717	659	797	696
June 19	721	411	605	743	483	746	691	749	397	717	750	725	751
June 20	---	660	612	388	675	631	749	714	203	691	750	802	478
June 21	648	667	672	419	634	769	721	692	452	662	701	806	332
June 22	660	588	504	625	497	680	718	782	606	672	639	802	197
June 23	240	659	647	268	508	803	716	762	606	349	759	650	337
June 24	635	299	664	505	549	785	747	775	596	559	736	535	(459)
Averages	600	541	619	527	538	(713)	728	747	461	624	713	731	(464)
Departures	---	---	---	---	---	---	24	---	-9	88	---	---	-59
June 25	628	113	581	579	738	766	720	770	541	652	730	462	499
June 26	292	384	551	726	665	764	750	737	363	324	483	---	418
June 27	630	590	661	52	724	715	745	707	511	688	758	633	352
June 28	393	622	589	180	713	536	764	472	643	499	744	822	681
June 29	179	718	672	109	716	703	669	703	461	311	758	749	654
June 30	257	728	579	256	708	717	703	672	522	---	742	818	(604)
July 1	395	573	594	327	685	497	725	749	637	(319)	621	812	232
Averages	396	533	604	319	707	671	725	687	525	(465)	691	716	(491)
Departures	---	---	---	---	---	---	12	---	35	-36	---	---	20
Accumulated Departures January 1 to July 1, 1954	---	---	---	---	---	---	---	---	266	238	---	---	---

	Ft. Worth, Tex.	Fresno, Calif.	Grand Junction, Colo.	Great Falls, Mont.	Greensboro, N. C.	Griffin, Ga.	Hatteras, N. C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.	Lake Charles, La.
1954											
June 4	838	(769)	582	633	740	636	669	206	852	455	758
June 5	789	810	778	537	814	798	763	352	907	188	706
June 6	711	796	546	754	813	767	817	644	904	85	634
June 7	477	(604)	797	463	755	763	791	605	826	779	---
June 8	782	367	813	641	748	757	742	425	710	780	696
June 9	803	(594)	508	124	641	707	575	646	919	749	728
June 10	778	(790)	465	108	633	587	719	672	880	480	672
Averages	740	(676)	641	466	735	716	725	507	857	502	699
Departures	---	-16	---	---	---	---	---	---	---	-33	---
June 11	742	760	855	708	673	713	707	693	897	686	727
June 12	818	---	842	766	688	504	(698)	664	577	677	682
June 13	848	780	478	414	674	684	771	568	867	706	503
June 14	784	779	671	512	617	634	742	635	848	702	635
June 15	463	772	715	506	554	653	783	691	851	545	---
June 16	803	804	678	801	477	728	561	397	868	389	680
June 17	827	789	831	817	172	619	535	591	874	578	485
Averages	755	781	724	646	551	649	(685)	606	826	612	619
Departures	---	59	---	---	---	---	---	---	---	99	---
June 18	819	791	829	843	425	334	268	468	875	764	469
June 19	(799)	(734)	835	754	706	714	852	666	851	773	552
June 20	693	752	829	---	776	770	853	664	868	645	441
June 21	640	739	833	834	802	840	681	678	858	492	463
June 22	794	(741)	838	828	738	669	412	507	844	513	480
June 23	808	718	630	819	600	622	729	773	790	464	579
June 24	786	759	717	354	793	800	792	739	854	711	480
Averages	(763)	(748)	787	739	691	678	655	642	849	623	495
Departures	---	22	---	---	---	---	---	---	---	96	---
June 25	793	771	675	727	772	778	818	741	606	635	645
June 26	719	760	445	155	781	763	780	629	865	308	643
June 27	774	771	485	441	752	760	618	710	881	288	671
June 28	804	745	833	193	680	776	594	743	879	371	625
June 29	774	732	837	670	788	798	794	614	867	264	562
June 30	719	752	611	719	764	793	737	584	872	650	659
July 1	746	772	696	454	718	741	728	724	879	527	581
Averages	761	758	655	480	751	773	724	678	836	435	626
Departures	---	33	---	---	---	---	---	---	---	-83	---
Accumulated Departures January 1 to July 1, 1954	---	5271	---	---	---	---	---	---	---	-889	---

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

SOLAR RADIATION DATA

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.-Continued

1954	Lander, Wyo.	Las Vegas, Nev.	Lincoln, Nebr.	Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBCO)	Madison, Wis.	Medford, Ore.	Miami, Fla.	Midland, Tex.	Nashville, Tenn.	Newport, R. I.	New York, N. Y.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Ottawa, Ontario	Phoenix, Ariz.	Portland, Me.
June 4------	549	664	693	781	623	460	552	382	358	---	376	534	392	240	769	---	813	312
June 5------	753	775	643	744	754	700	791	475	608	---	804	375	599	587	744	---	803	178
June 6------	563	---	645	749	771	788	690	831	615	---	755	586	586	687	618	---	832	487
June 7------	570	---	744	480	732	732	396	341	606	---	786	537	719	648	621	---	835	765
June 8------	516	637	619	685	700	644	713	416	697	---	691	605	790	691	745	---	796	509
June 9------	414	706	594	708	767	713	517	192	679	---	744	570	682	421	775	---	805	621
June 10------	808	785	665	726	730	726	354	458	692	---	753	637	255	664	757	---	779	788
Averages------	596	713	658	696	725	680	573	442	609	---	701	549	575	563	718	---	809	523
Departures----	---	---	142	---	---	---	50	---	---	---	123	-2	74	---	---	---	---	---
June 11------	778	796	614	721	751	722	700	455	605	---	658	398	580	597	761	---	806	724
June 12------	754	687	537	638	661	603	667	360	529	---	---	680	555	674	764	---	808	775
June 13------	654	761	256	644	234	206	700	391	637	705	688	510	685	650	789	---	770	221
June 14------	532	767	411	656	660	626	682	463	198	695	704	361	472	589	725	---	788	182
June 15------	492	757	138	616	674	667	665	533	173	719	642	140	378	581	467	---	791	163
June 16------	800	752	695	487	318	265	609	---	379	791	468	660	162	396	777	466	802	865
June 17------	635	761	612	565	609	476	721	803	257	782	654	802	750	344	784	711	817	870
Averages------	664	755	466	618	558	509	688	501	397	738	636	507	512	547	724	---	797	543
Departures----	---	---	-74	---	---	---	170	---	---	---	93	-18	27	---	---	---	---	---
June 18------	829	766	546	594	703	677	345	832	124	811	725	791	802	619	779	774	801	867
June 19------	578	771	646	560	621	578	323	551	507	704	646	774	775	456	775	(563)	780	837
June 20------	759	772	613	708	680	733	311	833	497	764	720	740	742	628	773	(473)	781	687
June 21------	850	756	616	672	359	650	302	856	434	792	758	730	687	688	750	(739)	796	597
June 22------	853	718	725	678	274	496	688	832	184	629	727	726	714	594	652	(383)	763	763
June 23------	672	594	714	666	528	549	745	805	411	668	748	251	243	611	766	(692)	698	237
June 24------	375	705	693	676	492	506	719	822	325	665	777	676	724	742	779	726	703	821
Averages------	702	726	650	651	522	598	490	790	355	719	729	670	670	620	753	(621)	760	687
Departures----	---	---	85	---	---	---	-37	---	---	---	144	105	179	---	---	---	---	---
June 25------	647	282	701	629	358	272	640	569	346	800	678	651	553	705	781	(607)	457	717
June 26------	524	594	685	664	290	261	475	497	508	660	716	314	425	696	694	---	593	292
June 27------	522	741	657	694	635	---	741	---	516	641	562	722	811	632	769	(194)	790	655
June 28------	853	786	486	658	629	(700)	667	849	669	451	731	524	540	746	791	---	817	660
June 29------	925	792	556	417	629	723	391	---	697	379	775	382	387	752	760	(484)	786	229
June 30------	855	781	708	659	664	693	753	620	698	785	720	503	611	719	---	301	756	289
July 1------	853	775	581	663	644	685	585	815	685	805	686	260	445	673	737	(488)	745	643
Averages------	740	679	625	626	550	(556)	608	670	589	646	695	480	539	703	755	(415)	709	498
Departures----	---	---	31	---	---	---	58	---	---	---	132	-61	41	---	---	---	---	---
Accumulated Departures January 1 to July 1, 1954	---	---	1463	---	---	---	916	---	---	---	12187	---	---	---	---	---	---	---

1954	Rapid City, S. Dak.	Riverside, Calif.	San Antonio, Tex.	Santa Maria, Calif.	S. Ste. Marie, Mich.	Sayville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle, Wash. (WBAS)	State College, Pa.	Stillwater, Okla.	Swan Island, W. I.	Tampa, Fla.	Toronto, Canada	Upton, N. Y.	Wake Island, Pacific Area	Washington, D. C. (Silver Hill Obs.)	Winnipeg, Manitoba
June 4------	564	580	774	---	180	533	337	584	697	400	712	496	409	226	588	660	598	792
June 5------	683	755	670	---	753	564	291	528	433	332	688	---	701	191	494	641	470	689
June 6------	569	820	626	---	808	521	221	582	131	654	411	277	698	569	590	(682)	---	425
June 7------	621	774	757	---	805	633	626	766	286	805	587	339	450	754	586	---	617	235
June 8------	744	784	711	---	460	718	389	719	556	777	681	324	562	(709)	710	708	590	187
June 9------	267	693	789	---	695	729	657	697	345	654	724	162	708	(699)	446	717	523	381
June 10------	102	807	710	---	791	407	542	336	540	536	730	181	708	523	333	564	227	439
Averages------	507	745	720	---	642	586	437	602	427	594	648	296	605	(524)	535	(662)	504	450
Departures----	---	180	---	---	---	---	---	---	---	55	---	---	---	---	---	---	---	---
June 11------	774	788	726	---	612	604	579	---	369	729	683	340	650	673	580	688	598	136
June 12------	737	757	751	---	546	404	627	644	333	577	338	672	616	469	562	710	657	547
June 13------	520	274	769	---	631	631	491	497	445	657	670	454	628	721	587	600	532	664
June 14------	312	744	669	---	429	301	588	567	437	644	577	356	526	655	416	---	550	413
June 15------	525	749	356	---	680	---	230	318	350	262	524	---	397	536	468	710	415	391
June 16------	308	514	728	---	422	269	273	145	714	124	710	---	597	350	265	725	84	776
June 17------	384	458	750	---	573	806	665	563	691	151	722	697	488	63	748	676	249	612
Averages------	509	612	678	---	556	502	493	456	477	449	603	504	557	495	518	685	441	506
Departures----	---	3	---	---	---	---	---	---	---	-22	---	---	---	---	---	---	---	---
June 18------	608	735	582	---	243	850	685	785	649	807	691	648	304	664	813	687	728	710
June 19------	705	727	700	---	286	816	658	743	311	802	668	---	367	614	774	725	764	397
June 20------	222	768	655	---	182	764	528	749	693	747	702	524	550	503	732	715	760	772
June 21------	754	763	713	---	(194)	771	513	706	768	727	716	308	645	326	---	690	735	425
June 22------	774	650	743	---	338	790	526	723	592	667	587	642	332	510	---	712	725	620
June 23------	730	661	757	---	776	295	395	551	742	630	683	688	398	571	---	693	694	757
June 24------	438	691	748	---	212	770	584	695	815	765	721	665	545	595	768	661	744	703
Averages------	605	714	700	---	(319)	722	555	708	653	735	681	579	449	540	772	698	736	626
Departures----	---	102	---	---	---	---	---	---	---	189	---	---	---	---	---	---	---	---
June 25------	288	315	546	(716)	195	500	461	616	413	635	721	---	602	459	501	621	634	691
June 26------	355	543	295	730	---	454	450	470	394	508	654	191	665	351	382	439	583	782
June 27------	502	569	679	728	811	797	300	734	548	797	707	502	662	662	789	672	734	653
June 28------	639	766	560	762	788	451	186	603	769	454	722	590	693	753	493	710	543	563
June 29------	777	720	746	760	544	379	372	521	735	681	661	160	627	721	428	723	654	208
June 30------	743	669	796	631	395	639	430	692	127	608	431	223	640	404	543	668	683	367
July 1------	489	767	775	768	420	342	408	587	141	678	669	669	500	659	325	706	679	299
Averages------	542	621	628	(728)	526	509	372	603	447	623	652	389	627	528	494	648	644	509
Departures----	---	13	---	---	---	---	---	---	---	80	---	---	---	---	---	---	---	---
Accumulated Departures January 1 to July 1, 1954	---	9037	---	---	---	---	---	---	---	4585	---	---	---	---	---	---	---	---

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

DELAYED DATA

Section	Temperature								Precipitation					
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes			
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least
	°F.	°F		°F			°F		In.	In.		In.		In.
November 1953														
Alaska	11.6	-0.8	Tree Point Light Sta.	61	11	Fort Yukon CAA	-38	4	1.45	-0.50	Baranof	26.36	Chitina	0.00
December 1953														
Alaska	4.1	1.8	Ketchikan	52	16	Umiat	-54	31	2.08	.18	Little Port Walter	38.70	Point Lay	.04
Hawaii	68.8	-.7	Puunene CAA AP	89	°2	Kole Kole	29	13	5.55	-2.89	Makahanaloa	18.40	Puu Laau	.76
January 1954														
Alaska	-3.8	-4.0	Cape Decision	50	30	Eagle	-64	28	1.38	-.44	Whittier	15.07	Wales AP	T
Hawaii	68.0	-.5	2 Stations	08	°24	Haleakala RS	34	°8	3.60	-4.43	Kawainui Lower	12.86	Puako	T
February 1954														
Alaska	-7.1	-10.9	Guard Island	57	5	Allakaket	-70	25	1.41	.04	Little Port Walter	25.75	Wales AP	T
Hawaii	69.3	.5	2 Stations	88	°17	Kole Kole	31	°6	5.56	-.96	Hanalei Tun	26.00	Mahukona	.15
March 1954														
Alaska	13.4	3.1	Tree Point Light Sta.	62	16	Umiat	-48	10	1.49	.09	Whittier	14.81	Chicken	T
Hawaii	67.7	-1.0	Puunene CAA AP	88	28	Kole Kole	25	6	8.05	-.25	East Honomanu	28.18	Pohakuloa	1.46
April 1954														
Alaska	22.9	-1.5	Talkeetna CAA AP	58	25	Umiat	-34	16	.54	-.56	Baranof	12.03	7 Stations	.00
Hawaii	70.8	.7	5 Stations	90	°9	Kole Kole	33	°18	4.72	-2.74	East Honomanu	22.40	Puako	.30
May 1954														
Hawaii	70.5	-.9	Puunene CAA AP	93	30	Kole Kole	32	10	6.93	1.58	East Honomanu	50.58	Hukipo	.00

CLIMATOLOGICAL DATA

Table 2

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F	°F	°F.	°F.		°F.		#		°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
August 1953																																
WASHINGTON																																
Stampede Pass	3963	880.0	1018.0	65	47	56.1	-0.5	86	14	39	24	0	0	--	--	2.65	0.57	1.14	17	3	0.0	0	----	---	--	---	--	9	8	14	5.8	--
September 1953																																
WASHINGTON																																
Stampede Pass	3963	881.5	1019.5	60	44	52.0	.8	79	6	32	28	0	1	--	--	3.64	-.40	1.32	13	0	.4	T	----	---	--	---	--	12	5	13	5.5	--
October 1953																																
WASHINGTON																																
Stampede Pass	3963	082.2	1021.3	51	39	45.0	2.6	62	°7	30	21	0	2	--	--	6.77	-2.57	1.86	13	0	T	T	----	---	--	---	--	12	5	14	5.8	--
November 1953																																
WASHINGTON																																
Stampede Pass	3958	876.4	1016.3	38	30	33.9	2.3	46	14	23	17	0	24	--	--	10.13	-3:13	1.58	25	0	37.7	12	----	---	--	---	--	0	3	27	9.4	--
December 1953																																
WASHINGTON																																
Stampede Pass	3958	800.8	1025.8	33	27	29.7	3.5	40	0	20	8	0	31	--	--	29.06	14.40	4.47	27	0	122.2	70	----	---	--	---	--	0	3	28	9.5	--
ALASKA																																
Anchorage	92	992.6	997.5	25	11	17.9	4.1	41	22	-13	14	0	31	13	77	1.11	.27	.26	12	0	20.0	13	4.0	NE	*17	NNE	7	2	4	25	8.8	20
Annette Island	110	1004.4	1008.3	44	36	39.9	3.7	51	16	32	°1	0	5	36	87	16.22	7.11	2.28	29	0	.2	T	14.9	ESE	*56	SSE	10	0	2	29	9.5	--
Barrow	22	1014.6	1015.3	-12	-22	-17.0	-6.6	-2	3	-35	°17	0	31	-27	60	.08	-.12	.02	6	0	.8	10	10.3	---	40	E	24	a	a	a	a	--
Bethel	21	995.6	997.0	16	1	8.5	1.3	36	1	-32	12	0	31	6	83	.83	-.02	.17	15	0	9.9	16	10.9	NE	*39	NNE	16	5	6	20	7.5	--
Cordova	40	995.3	996.9	37	25	30.9	3.6	42	°16	2	14	0	22	28	86	12.51	5.72	1.74	25	0	34.0	12	4.9	E	*22	E	21	2	1	28	9.2	--
Fairbanks	436	985.1	1003.3	4	-12	-4.1	8.4	21	°16	-30	31	0	31	-12	71	.13	-.31	.06	4	0	5.5	6	2.6	N	16	NE	7	6	5	20	7.4	--
Juneau	15	1003.1	1004.1	36	28	32.3	4.7	43	22	11	°6	0	19	30	90	5.02	.85	1.31	23	0	4.0	2	8.4	E	34	SE	°8	0	5	26	9.1	24
Kotzebue	10	1004.7	1005.3	4	-10	-3.1	.4	23	23	-30	10	0	31	-8	78	.45	.12	.12	14	0	8.5	9	10.8	NNE	*30	ENE	29	8	1	22	7.2	--
McGrath	334	988.2	1001.5	3	-10	-3.3	4.3	17	22	-29	10	0	31	-6	83	.61	-.64	.17	15	0	7.8	13	.9	WNW	*14	NNE	16	3	4	27	8.4	--
Nome	13	1001.8	1001.6	13	-1	6.2	-1.5	33	24	-22	6	0	31	1	76	.40	-.76	.18	8	0	4.2	8	7.7	NE	32	N	10	9	5	17	6.4	38
Northway	1713	939.4	1006.1	-6	-19	-12.6	2.2	11	27	-38	14	0	31	-17	79	.24	-.16	.14	6	0	5.7	11	2.6	NW	*24	NW	27	1	7	23	8.4	--
St. Paul Island	22	993.6	994.6	30	21	25.6	-3.7	39	°1	10	°11	0	29	22	83	.94	-1.05	.23	16	0	6.5	6	----	---	--	---	--	4	4	23	8.1	--
Yakutat	28	998.6	999.8	37	28	32.3	4.6	44	21	5	6	0	23	31	91	16.56	4.25	2.12	27	0	57.0	21	10.1	E	*50	ESE	21	1	0	30	9.5	--
January 1954																																
WASHINGTON																																
Stampede Pass	3958	872.0	1013.3	26	18	22.1	-1.6	42	31	-5	20	0	30	--	--	20.56	7.51	3.76	26	0	153.6	145	----	---	--	---	--	1	4	26	9.0	--
PACIFIC AREA																																
Ponape	112	1004.4	1009.7	05	77	81.0	-.2	09	9	73	°4	0	0	--	--	11.95	.21	5.04	23	0	.0	0	----	---	--	---	--	--	--	--	---	--
ALASKA																																
Anchorage	92	1006.4	1011.7	19	1	9.8	-3.2	36	9	-22	28	0	31	-2	60	.56	-.20	.34	7	0	8.1	14	5.5	NNE	34	NNE	26	11	5	15	5.6	55
Annette Island	110	1004.7	1008.9	35	26	30.2	-4.4	46	30	8	25	0	19	19	67	7.41	-1.99	1.31	18	0	6.8	4	17.0	ESE	*56	SSE	30	7	3	21	7.1	--
Barrow	22	1023.7	1024.2	-8	-26	-16.9	-1.8	23	°19	-48	11	0	31	-27	61	.47	.31	.19	8	0	4.6	14	10.3	---	43	W	20	**	**	**	**	--
Bethel	21	1018.3	1019.6	3	-16	-6.5	-13.3	35	14	-42	6	0	31	-12	74	.27	-.63	.23	3	0	2.6	17	11.0	NNE	*37	NNE	7	15	6	10	4.4	--
Cordova	40	1006.1	1008.2	32	17	24.4	-.6	43	°8	-3	°27	0	28	16	72	5.48	-1.57	1.79	10	0	14.4	19	5.7	E	*28	ESE	9	7	8	16	6.6	--
Fairbanks	436	1002.4	1021.0	-4	-26	-14.6	-4.8	20	8	-48	20	0	31	-24	61	.55	-.44	.14	8	0	18.6	19	2.4	N	29	W	15	9	7	15	6.1	--

CLIMATOLOGICAL DATA

Table 2—Continued

DELAYED DATA

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)				
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F	°F	°F.	°F.	°F.		°F.		#		°F.	%	In.	In.	In.			In.	In.	M p. h.		M p. h.			0–3	4–7	8–10	0–10	%
January 1954 (Cont'd)																																
ALASKA (Coot'd.)																																
Juneau	15	1011.9	1012.7	26	15	20.7	-5.5	41	30	-8	27	0	28	11	68	2.01	-2.47	.62	11	0	10.4	7	8.7	E	40	SE	30	10	3	18	6.5	57
Kotzebue	10	1022.7	1023.2	0	-15	-7.3	-.7	27	22	-39	11	0	31	-13	74	.27	-.20	.12	6	0	3.8	11	12.8	ESE	•33	W	°1	13	5	13	5.2	--
McGrath	334	1001.7	1020.6	-5	-23	-13.7	-5.0	19	15	-45	°6	0	31	-18	79	.63	-.51	.28	10	0	7.3	18	2.9	N	•18	NE	2	13	6	12	5.2	--
Nome	13	1021.3	1022.1	8	-10	-1.0	-6.6	32	14	-32	10	0	31	-8	74	.74	-.51	.37	6	0	9.6	13	6.9	E	34	W	15	12	2	17	5.6	45
Northway	1713	953.3	1021.7	-12	-32	-21.6	-4.5	14	18	-58	28	0	31	-25	78	.16	-.45	.06	6	0	4.4	12	3.6	NW	•26	NW	18	4	8	19	7.2	--
St. Paul Island	22	1017.3	1018.5	26	16	21.2	-5.2	38	16	-8	31	0	30	17	82	.46	-1.36	.25	0	0	3.2	6	----	---	--	---	--	7	5	19	6.8	--
Yakutat	28	1008.5	1009.5	30	15	22.6	-3.9	42	9	-10	28	0	29	15	73	7.65	-3.95	2.20	14	0	32.7	23	7.1	E	•34	ESE	9	7	4	20	7.2	--
February 1954																																
WASHINGTON																																
Stampede Pass	3958	878.8	1020.3	32	23	27.7	.7	52	8	8	11	0	27	--	--	15.59	4.52	3.14	18	0	110.1	157	----	---	--	---	--	6	1	21	7.8	--
March 1954																																
WASHINGTON																																
Stampede Pass	3958	876.1	1017.1	33	22	27.5	-3.2	44	5	9	28	0	31	--	--	6.62	-3.98	3.34	14	0	49.3	149	----	---	--	---	--	11	2	18	6.3	--
PACIFIC AREA																																
Ponape CO	112	1005.8	1011.0	87	76	81.3	-.3	90	°16	73	29	3	0	--	--	13.45	2.09	3.17	23	--	.0	0	----	---	--	---	--	--	--	--	---	--
ALASKA																																
Anchorage	92	1011.2	1016.3	33	12	22.4	-2.4	47	°30	-4	18	0	31	14	68	.97	.37	.20	14	0	14.9	17	3.8	NNE	•20	SSW	2	9	3	19	6.6	57
Annette Island	110	1013.5	1017.6	42	31	36.7	-1.4	50	°23	24	10	0	22	29	74	5.83	-2.85	1.80	14	0	11.4	8	12.2	NNW	•38	SSE	15	8	6	17	6.5	--
Barrow	22	1018.6	1019.4	-2	-18	-10.1	4.8	29	28	-44	4	0	31	-18	66	.15	.03	.04	6	0	1.6	17	10.6	---	34	SW	16	10	10	11	5.2	--
Bethel	21	1013.5	1015.1	28	5	16.0	4.5	48	31	-36	13	0	31	13	83	2.00	1.08	.36	18	0	20.8	33	12.1	S	•49	SSE	14	8	5	18	6.7	--
Cordova	40	1013.2	1015.1	38	16	27.0	-3.1	52	28	-3	19	0	31	22	81	3.06	-2.06	1.21	12	0	32.4	34	3.1	E	•30	E	1	10	3	18	6.4	--
Fairbanks	436	1000.3	1018.1	27	-4	11.7	2.7	46	°29	-25	°14	0	31	2	62	.60	.02	.43	6	0	8.6	17	3.3	N	22	W	3	12	6	13	5.6	--
Juneau	15	1016.9	1017.4	39	23	30.8	-2.0	51	30	6	1	0	31	24	77	1.49	-1.98	.61	12	0	14.3	8	7.7	ESE	43	SE	3	9	4	18	6.7	63
Kotzebue	10	1015.2	1015.9	13	-5	4.7	6.3	34	29	-33	3	0	31	0	78	1.23	.96	.47	13	0	21.9	17	17.9	ESE	•55	ESE	15	10	3	18	6.2	--
McGrath	334	1004.1	1017.4	26	-4	11.1	3.8	51	°27	-37	4	0	31	6	76	1.04	.06	.65	9	0	6.6	25	3.5	WNW	•23	SSW	20	11	6	14	5.7	--
Nome	13	1012.9	1013.5	22	3	12.9	4.4	42	29	-27	13	0	31	9	80	1.95	1.04	.65	13	0	19.7	21	13.5	E	52	E	6	8	5	18	6.9	43
Northway	1713	952.6	1018.6	23	-8	7.1	.2	46	26	-26	15	0	31	1	72	.18	-.04	.16	4	0	2.5	13	6.6	NW	•25	NW	16	6	8	17	6.0	--
St. Paul Island	22	1010.8	1012.5	31	21	25.8	1.3	36	°14	-9	12	0	31	23	87	2.05	.88	.61	16	0	17.4	21	----	---	--	---	--	3	8	20	7.6	--
Yakutat	28	1015.2	1016.3	38	19	28.7	-2.1	51	30	4	15	0	31	25	86	6.03	-3.86	1.36	16	0	57.0	39	4.9	ESE	•36	SE	1	6	5	20	7.4	--

•• Sun below horizon from January 1 to 24 inclusive.
a Sun below horizon.
Also see footnotes with current data.

HEATING DEGREE DAYS

Table 3

State and station	Current season		Normals
	This month	Period July through this month	July through this month
July 1953			
WASHINGTON			
Stampede Pass	301	301	251
August 1953			
WASHINGTON			
Stampede Pass	283	584	511
September 1953			
WASHINGTON			
Stampede Pass	387	971	925
ALASKA			
Anchorage	530	926	1040
Annette	352	784	836
Barrow	1022	2792	2641
Bethel	594	1138	1298
Cordova	523	1195	1233
Fairbanks	586	987	1057
Juneau	467	1009	1134
Kotzebue	671	1567	1550
McGrath	605	1073	1193
Nome	636	1523	1660
Northway	730	1234	1211
St. Paul	599	1543	1710
Yakutat	490	1133	1257
WASHINGTON			
Stampede Pass			
January 1954	1324	4922	5111
February 1954	1038	5960	6175
March 1954	1155	7115	7230

State and station	Current season		Normals
	This month	Period July through this month	July through this month
October 1953			
WASHINGTON			
Stampede Pass	612	1583	1626
ALASKA			
Anchorage	941	1867	1939
Annette	509	1293	1397
Barrow	1742	4534	4126
Bethel	1121	2259	2327
Cordova	787	1982	1983
Fairbanks	1267	2254	2220
Juneau	668	1677	1850
Kotzebue	1297	2864	2775
McGrath	1306	2379	2352
Nome	1139	2662	2745
Northway	1374	2600	2473
St. Paul	911	2459	2513
Yakutat	711	1844	1979
January 1954			
ALASKA			
Anchorage	1706	6346	6419
Annette	1074	3810	3964
Barrow	2541	11606	10075
Bethel	2221	7667	7363
Cordova	1251	5314	5430
Fairbanks	2475	8756	8693
Juneau	1368	5004	5169
Kotzebue	2244	0793	8850
McGrath	2442	8005	8663
Nome	2046	7069	7808
Northway	2692	9893	9508
St. Paul	1353	5980	5753
Yakutat	1306	5147	5265

State and station	Current season		Normals
	This month	Period July through this month	July through this month
November 1953			
WASHINGTON			
Stampede Pass	927	2510	2620
ALASKA			
Anchorage	1323	3190	3220
Annette	671	1964	2126
Barrow	1983	6517	6055
Bethel	1436	3695	3767
Cordova	1032	3014	3000
Fairbanks	1801	4135	4077
Juneau	953	2630	2807
Kotzebue	1571	4435	4500
McGrath	1868	4247	4137
Nome	1330	4000	4191
Northway	2180	4788	4489
St. Paul	952	3411	3449
Yakutat	990	2834	2918
February 1954			
ALASKA			
Anchorage	1633	7979	7710
Annette	073	4683	4773
Barrow	2486	14092	13196
Bethel	2074	9741	8928
Cordova	1251	6565	6519
Fairbanks	2299	11055	10600
Juneau	1152	6156	6225
Kotzebue	2242	11035	10802
McGrath	2231	11036	10472
Nome	2069	9930	9468
Northway	2401	12294	11591
St. Paul	1503	7563	6907
Yakutat	1166	6313	6301

State and station	Current season		Normals
	This month	Period July through this month	July through this month
December 1953			
WASHINGTON			
Stampede Pass	1088	3598	3831
ALASKA			
Anchorage	1450	4640	4307
Annette	772	2736	3022
Barrow	2548	9065	0392
Bethel	1751	5446	5559
Cordova	1049	4063	4190
Fairbanks	2146	6281	6374
Juneau	1006	3636	3966
Kotzebue	2114	6549	6630
McGrath	2116	6363	6378
Nome	1023	5823	5967
Northway	2413	7201	6963
St. Paul	1216	4627	4556
Yakutat	1007	3841	4071
March 1954			
ALASKA			
Anchorage	1315	9294	8964
Annette	870	5553	5607
Barrow	2331	16423	15673
Bethel	1513	11254	10597
Cordova	1170	7735	7601
Fairbanks	1650	12705	12336
Juneau	1055	7211	7223
Kotzebue	1065	12900	12867
McGrath	1570	12706	12261
Nome	1610	11548	11220
Northway	1792	14086	13392
St. Paul	1209	8772	8163
Yakutat	1120	7433	7361

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4

DELAYED DATA

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Dec. 1953										
Naylor (3 miles west of), Lowndes County, Ga.	22	1:30-2:30 p.m.	4	*3			$4,000	$500	Wind and hail	High winds damaged numerous roofs, ripping some tin roofs completely off. A kitchen torn from house and rolled over on its side. Timber badly damaged; many trees broken off 10 to 14 feet above ground. This only evidence indicating possible tornado with tip of funnel not reaching ground, but other damages indicate straight-line wind. Hail up to ½ inch or more in diameter severely damaged greens in gardens and knocked off a great many leaves and needles from pine trees.
Philadelphia, Pa.	30				9				Fog	Near Point Breeze, 2 tankers collided in heavy fog and burned, with 9 persons killed.
May 1953										
Ft. Mitchell area, Russell County, Ala.	2	P.m.	4	600	0	0	20,000	11,600	Tornado, electrical, and hail	Storm path eastward, with trees on south edge lying toward north and those on north edge lying toward south; trees in middle of area lying in all directions. Excessive lightning and tremendous hailstorm accompanied tornado. Area in Ochee Creek Valley, about 1/4 mile wide, covered with about 2 inches of hail and in some places hail piled to depths of 8 to 12 inches. Hailstones ranged from 1 to 1-3/4 inches in diameter and consisted of hard ice.
April 1954										
Spartanburg County, S. C.	28	6-11 p.m.						250,000	Hail	Severe damage to peach crop. Section around Inman hardest hit. Also hit was around Campobello and on edge of Spartanburg-Greenville County line.
Atkins (near), Pope County, Ark.	30	Noon			0	0	Considerable	0	Tornado and rain	1 barn wrecked with $1,500 damage. Funnel-shaped cloud observed. Roar heard. Considerable damage to business section by heavy rains; highest water in business section for many years.
May 1954										
Bellefonte (near), Pa.	29	Day				2			Electrical	2 boys stunned while milking cows; 6 cows killed; stanchions and milking equipment damaged.
Ridgeland, Madison County, Miss.	27	2:30 p.m.			0	0	500		Tornado	Reported to have touched ground to demolish tool shed and porch of house, then moved across small pond drawing water up into funnel.

RADIOSONDE DATA

Average monthly values

Table 20

Standard pressure surface (mb.)	a HAVANA, CUBA (1011 MB.)				b CAMAGUEY, CUBA (1002 MB.)				c HAVANA, CUBA (1008 MB.)				d HAVANA, CUBA (1011 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	10	49	23.5		28	122	24.4	92	20	49	25.9	89	29	49	22.9	83
1,000	10	144	24.0		28	139	24.5	90	20	120	26.2	84	29	144	23.1	79
950	10	602	21.4		28	594	23.9	78	20	576	24.2	80	29	593	20.4	79
900	10	1,061	18.4		28	1,063	21.6	71	20	1,047	21.3	77	29	1,056	17.3	80
850	10	1,550	15.8		28	1,558	18.7	71	20	1,540	18.2	76	29	1,543	14.8	75
800	10	2,063	13.5		28	2,076	15.5	66	20	2,058	15.3	70	29	2,055	13.0	62
750	10	2,615	11.2		28	2,624	12.4	58	20	2,605	12.2	65	29	2,600	10.5	52
700	10	3,179	8.7		28	3,197	9.0	52	20	3,178	9.1	60	29	3,168	7.9	43
650	10	3,803	6.0		28	3,813	5.6	46	20	3,793	5.6	66	29	3,779	4.5	41
600	10	4,440	2.0		28	4,458	1.9	45	20	4,441	2.2	59	29	4,424	.9	38
550	10	5,147	- 1.8		28	5,160	- 2.3	45	20	5,141	- 1.7	58	29	5,117	- 3.2	36
500	10	5,891	- 6.5		28	5,906	- 6.6	41	20	5,893	- 6.0	51	29	5,866	- 7.7	
450	10	6,718	-11.7		28	6,722	-11.5	39	20	6,715	-10.9	48	29	6,688	-13.4	
400	10	7,600	-18.5		28	7,616	-17.3	41	20	7,608	-16.4	47	29	7,565	-19.4	
350	10	8,583	-25.3		28	8,603	-24.2		19	8,597	-23.3		29	8,542	-26.8	
300	10	9,683	-33.8		28	9,709	-32.5	40	19	9,706	-31.6		29	9,635	-35.0	
250	10	10,936	-43.6		28	10,968	-42.6		19	10,969	-41.7		29	10,881	-44.6	
200	10	12,397	-55.7		28	12,438	-54.6		19	12,442	-54.0		28	12,338	-55.6	
175	10	13,235	-62.0		28	13,280	-60.5		19	13,285	-60.9		28	13,177	-61.4	
150	10	14,174	-68.8		27	14,227	-66.5		19	14,228	-67.6		28	14,120	-66.7	
125	10	15,246	-74.4		26	15,321	-69.1		17	15,303	-73.9		27	15,209	-70.4	
100	7	16,543	-75.2		21	16,649	-71.4		15	16,605	-73.2		26	16,525	-74.2	
80					19	17,972	-69.0		14	17,924	-68.9		23	17,818	-73.9	
60					17	19,719	-63.6		11	19,660	-63.6		19	19,519	-67.3	
50					14	20,845	-60.5		9	20,785	-60.3		13	20,639	-62.3	
40					13	22,254	-56.4		8	22,184	-57.0		6	22,046	-57.6	
30					11	24,096	-52.3									

Standard pressure surface (mb.)	e HAVANA, CUBA (1013 MB.)				f HAVANA, CUBA (1014 M8.)				g HAVANA, CUBA (1011 M8.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	49	21.9	84	31	49	21.3	84	13	49	22.7	
1,000	31	160	21.8	80	31	169	21.3	80	13	148	22.5	
950	31	608	19.4	78	31	615	18.7	78	13	599	21.0	
900	31	1,069	16.4	75	31	1,076	16.0	71	13	1,062	18.5	
850	31	1,554	14.2	64	31	1,560	13.5	65	13	1,550	16.0	
800	31	2,065	13.0	47	31	2,069	11.6	46	13	2,063	13.3	
750	31	2,612	10.7	34	31	2,612	9.6	33	13	2,612	10.9	
700	31	3,178	7.8	35	31	3,178	7.3	24	13	3,177	8.4	
650	31	3,792	4.5	31	31	3,790	4.1		13	3,792	5.4	
600	31	4,433	.7	33	31	4,432	.3		13	4,435	1.3	
550	31	5,128	- 3.3	34	31	5,125	- 3.9		13	5,133	- 2.6	
500	31	5,874	- 8.3	38	31	5,869	- 9.0		13	5,880	- 7.5	
450	31	6,694	-13.5	36	31	6,683	-15.1		13	6,701	-13.0	
400	31	7,571	-19.5		31	7,556	-21.8		13	7,580	-19.7	
350	31	8,549	-26.5		31	8,523	-29.1		13	8,557	-26.7	
300	31	9,644	-34.7		31	9,606	-37.3		13	9,648	-36.0	
250	31	10,889	-44.8		30	10,840	-46.3		13	10,885	-46.3	
200	31	12,346	-55.8		30	12,289	-55.8		13	12,331	-57.0	
175	31	13,183	-61.9		30	13,129	-60.3		13	13,165	-62.4	
150	31	14,122	-68.1		26	14,085	-64.9		12	14,113	-66.9	
125	30	15,206	-72.3		26	15,183	-69.8		12	15,204	-71.0	
100	26	16,512	-75.9		24	16,490	-74.5		12	16,507	-75.9	
80	23	17,799	-77.0		21	17,778	-76.5		9	17,782	-76.6	
60	18	19,469	-69.8		14	19,460	-71.9		8	19,467	-69.3	
50	13	20,581	-64.2		12	20,541	-67.1		6	20,565	-62.9	
40	10	21,968	-59.7		9	21,912	-61.0		6	21,958	-57.7	
30					5	23,707	-55.7					

Standard pressure surface (mb.)	g MERIDA, MEX. (1011 MB.)				h CAMAGUEY, CUBA (1003 MB.)				h MERIOA, MEX. (1013 M8.)				j CAMAGUEY, CUBA (1000 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	27	25.4	69	30	122	22.5	89	30	27	26.7	71	31	122	22.7	96
1,000	31	126	24.5	70	30	152	22.5	88	30	138	25.9	70	31	125	22.7	96
950	31	577	21.9	70	30	601	20.5	80	30	589	23.4	68	31	583	22.4	79
900	31	1,043	19.2	70	30	1,065	18.4	70	30	1,060	20.4	71	31	1,044	20.0	75
850	31	1,533	16.7	70	30	1,553	15.8	67	30	1,552	17.4	68	31	1,535	17.2	74
800	31	2,048	14.7	61	30	2,066	12.6	69	30	2,067	14.1	69	31	2,051	14.3	68
750	31	2,597	12.3	49	30	2,609	9.6	62	30	2,612	10.9	62	31	2,601	11.2	65
700	29	3,166	9.6	35	30	3,176	6.7	50	30	3,182	7.8	53	31	3,167	7.7	61
650	29	3,781	6.1		30	3,785	3.4	46	30	3,796	5.1	40	31	3,782	3.9	62
600	29	4,428	2.4		29	4,427	.2		30	4,440	1.4		30	4,422	.2	60
550	29	5,126	- 1.9		29	5,121	- 3.7		29	5,140	- 2.3		30	5,117	- 3.7	56
500	29	5,876	- 7.1		28	5,865	- 8.1		28	5,889	- 6.9		30	5,862	- 7.7	55
450	28	6,693	-13.1		28	6,687	-13.6		28	6,710	-12.5		30	6,687	-12.6	54
400	28	7,575	-19.5		28	7,563	-19.5		27	7,592	-18.8		30	7,566	-18.4	51
350	27	8,550	-27.2		28	8,541	-26.7		27	8,572	-26.2		30	8,549	-25.1	50
300	26	9,637	-36.1		27	9,635	-35.0		27	9,668	-34.7		29	9,649	-33.3	46
250	25	10,873	-46.0		27	10,879	-44.7		26	10,913	-45.2		28	10,903	-43.2	
200	23	12,324	-56.8		27	12,333	-56.1		25	12,363	-56.9		28	12,368	-55.1	
175	21	13,163	-61.4		27	13,171	-61.2		25	13,196	-62.4		28	13,208	-61.7	
150	19	14,117	-65.8		27	14,116	-66.0		24	14,136	-66.9		28	14,147	-68.3	
125	16	15,207	-70.9		27	15,210	-70.2		20	15,221	-70.8		26	15,227	-72.7	
100	14	16,506	-75.0		24	16,528	-73.6		9	16,545	-74.4		23	16,519	-75.1	
80	9	17,796	-77.5		20	17,819	-74.3						14	17,814	-72.4	
60	8	19,458	-71.2		14	19,496	-70.6						12	19,545	-64.4	
50	8	20,554	-64.1		9	20,598	-64.0						11	20,669	-60.7	
40	7	21,946	-58.4		7	21,966	-58.5						8	22,080	-57.0	
30																

Standard pressure surface (mb.)	j VERACRUZ, MEX. (1009 MB.)				k CAMAGUEY, CUBA (1002 MB.)				k MERIOA, MEX. (1010 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	10	13	25.8		30	122	23.3	94	30	27	26.8	79
1,000	10	91	25.2		30	136	23.4	93	30	117	26.3	79
950	10	541	23.0		30	588	23.3	77	30	576	24.0	77
900	10	1,012	21.2		30	1,057	21.3	65	30	1,042	21.4	74
850	10	1,505	18.5		30	1,551	18.5	61	30	1,536	18.5	69
800	10	2,024	16.6		30	2,068	15.2	60	30	2,054	15.7	64
750	10	2,577	14.0		30	2,616	11.7	57	30	2,603	12.6	60
700	10	3,150	10.5		30	3,187	8.1	53	30	3,176	9.4	55
650	10	3,768	6.6		30	3,802	4.4	57	29	3,794	5.9	51
600	10	4,415	2.4		30	4,443	.7	55	28	4,439	2.3	50
550	9	5,109	- 1.9		30	5,140	- 3.2	57	28	5,138	- 1.5	38
500	9	5,862	- 6.8		30	5,886	- 7.5	62	27	5,889	- 5.9	
450	8	6,694	-11.8		30	6,708	-12.4	58	26	6,712	-11.2	
400	8	7,572	-17.3		30	7,592	-17.9	53	25	7,602	-16.9	45
350	7	8,559	-23.9		30	8,576	-24.6	49	24	8,591	-23.7	
300	7	9,665	-32.6		29	9,682	-32.7	47	21	9,703	-32.0	
250	7	10,924	-41.8		29	10,939	-42.8		20	10,962	-42.3	
200	6	12,406	-53.1		29	12,406	-54.9		17	12,432	-54.7	
175	6	13,253	-59.3		29	13,245	-61.7		15	13,274	-61.9	
150					29	14,185	-68.1		15	14,210	-68.8	
125					28	15,264	-72.4		12	15,286	-74.2	
100					22	16,571	-72.1		5	16,565	-74.2	
80					20	17,898	-68.9					
60					17	19,642	-64.0					
50					17	20,768	-60.4					
40					15	22,164	-57.3					
30					9	24,002	-53.4					

a November 1952
b August 1953
c September 1953
d November 1953
e December 1953
f January 1954
g March 1954
h April 1954
j May 1954
k June 1954

SOLAR RADIATION DATA

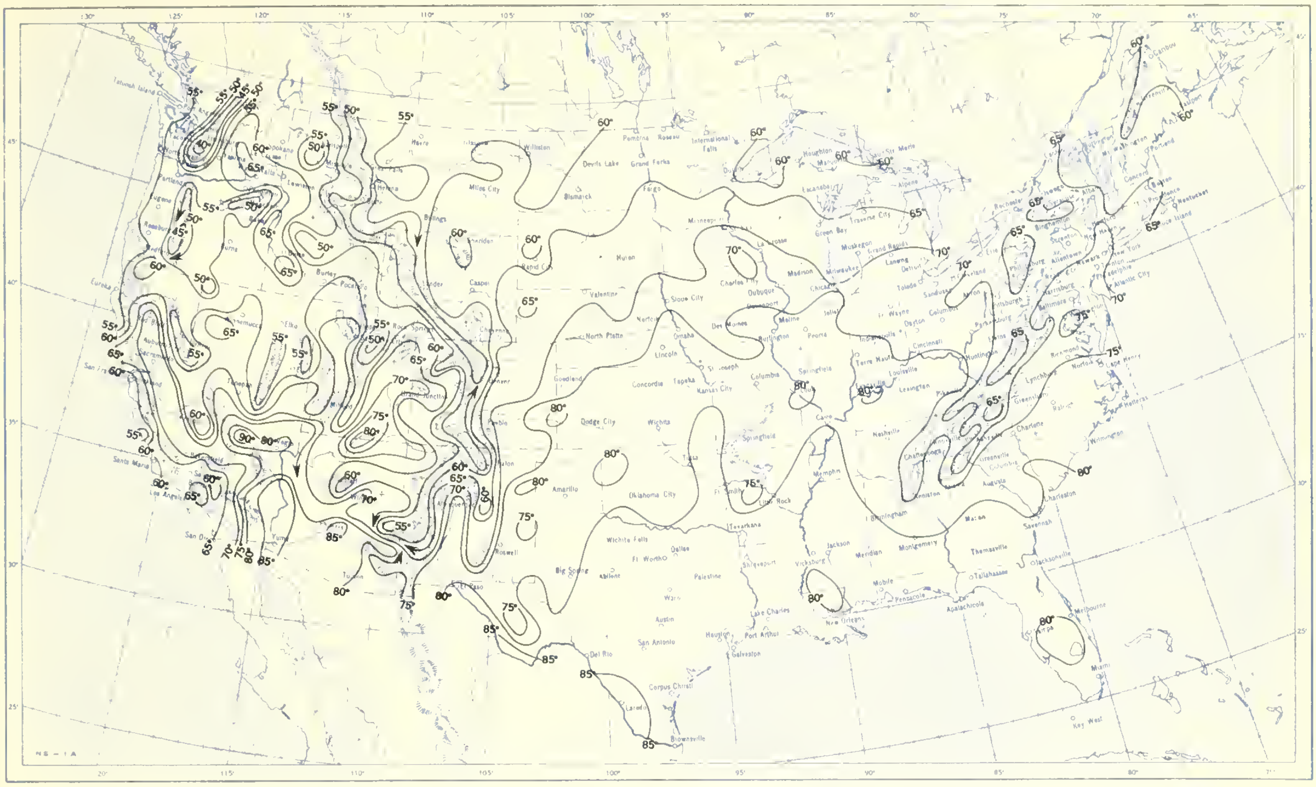
Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys. DELAYED DATA

	Wake Island, Pacific Area *		Seattle, Wash. (U. of W.)	Wake Island, Pacific Area *		Wake Island, Pacific Area *		Wake Island, Pacific Area *		Albrook Air Base, Panama, C. Z.		Aklavik, Mackenzie	Sayville, N. Y.
1953		Jan.			Feb.		Mar.		Apr.		May		
Dec. 3-------	---	1	96	458	5	517	5	467	2	704	7	474	671
Dec. 4-------	---	2	64	454	6	495	6	581	3	661	8	536	50
Dec. 5-------	---	3	51	422	7	534	7	620	4	618	9	683	393
Dec. 6-------	---	4	36	407	8	541	8	534	5	482	10	473	395
Dec. 7-------	---	5	24	428	9	476	9	598	6	554	11	294	443
Dec. 8-------	---	6	38	463	10	545	10	606	7	624	12	487	535
Dec. 9-------	---	7	28	407	11	315	11	549	8	339	13	531	439
Averages-------	---		48	434		489		565		569		497	418
Departures-----	---		---	---		---		---		---		---	---
Dec. 10-------	---	8	110	458	12	335	12	---	9	512	14	(735)	(454)
Dec. 11-------	465	9	16	272	13	514	13	604	10	382	15	730	234
Dec. 12-------	461	10	140	215	14	356	14	605	11	432	16	708	607
Dec. 13-------	461	11	154	392	15	437	15	560	12	612	17	682	301
Dec. 14-------	380	12	128	371	16	440	16	638	13	584	18	----	---
Dec. 15-------	368	13	17	374	17	522	17	481	14	643	19	604	496
Dec. 16-------	429	14	97	476	18	443	18	641	15	532	20	740	(155)
Averages-------	427		95	366		436		588		528		(713)	(388)
Departures-----	---		---	---		---		---		---		---	---
Dec. 17-------	466	15	55	345	19	576	19	630	16	507	21	799	103
Dec. 18-------	457	16	48	451	20	546	20	426	17	255	22	763	398
Dec. 19-------	349	17	68	480	21	581	21	625	18	290	23	501	645
Dec. 20-------	459	18	64	479	22	525	22	582	19	277	24	586	524
Dec. 21-------	379	19	---	491	23	542	23	622	20	441	25	375	464
Dec. 22-------	316	20	---	457	24	492	24	647	21	401	26	458	783
Dec. 23-------	402	21	235	464	25	486	25	648	22	609	27	348	182
Averages-------	404		94	453		535		597		397		547	443
Departures-----	---		---	---		---		---		---		---	---
Dec. 24-------	428	22	---	435	26	516	26	538	23	626	28	579	598
Dec. 25-------	442	23	---	431	27	401	27	608	24	656	29	777	497
Dec. 26-------	454	24	---	375	20	261	28	609	25	345	30	765	759
Dec. 27-------	390	25	---	478	1	455	29	555	26	428	31	578	757
Dec. 28-------	385	26	---	525	2	556	30	619	27	380	1	707	672
Dec. 29-------	429	27	---	403	3	569	31	600	28	389	2	587	627
Dec. 30-------	410	28	---	511	4	568	1	546	29	601	3	445	744
Dec. 31-------	436												
Averages-------	422		---	451		475		582		489		634	665
Departures-----	---		---	---		---		---		---		---	---
		29	54	471					30	301			
		30	34	526					1	425			
		31	125	486					2	290			
		1	91	475					3	249			
		2	164	480					4	405			
		3	80	439					5	463			
		4	196	497					6	394			
		Avg.	106	400						362			
		Dep.	---	---						---			

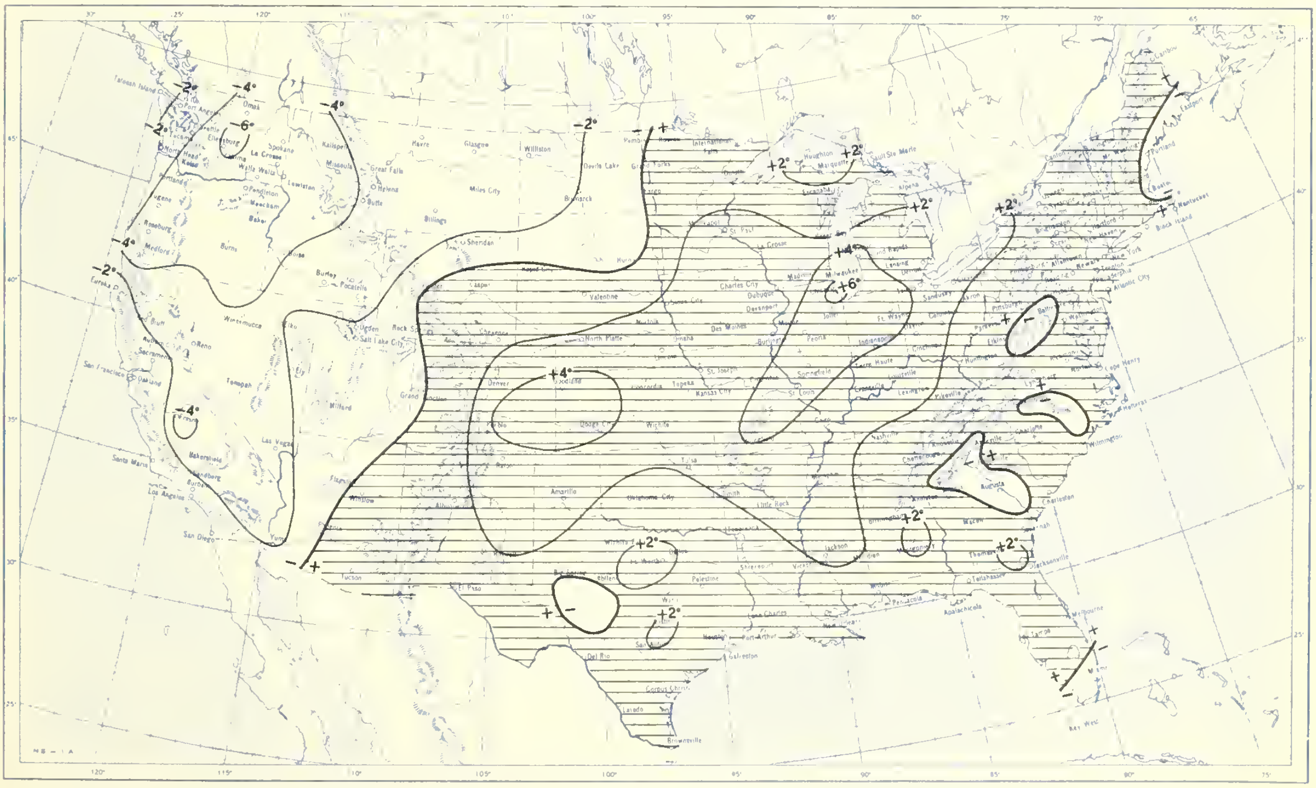
Note.--Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.

* These are corrected data.

Chart I. A. Average Temperature (°F.) at Surface, June 1954.

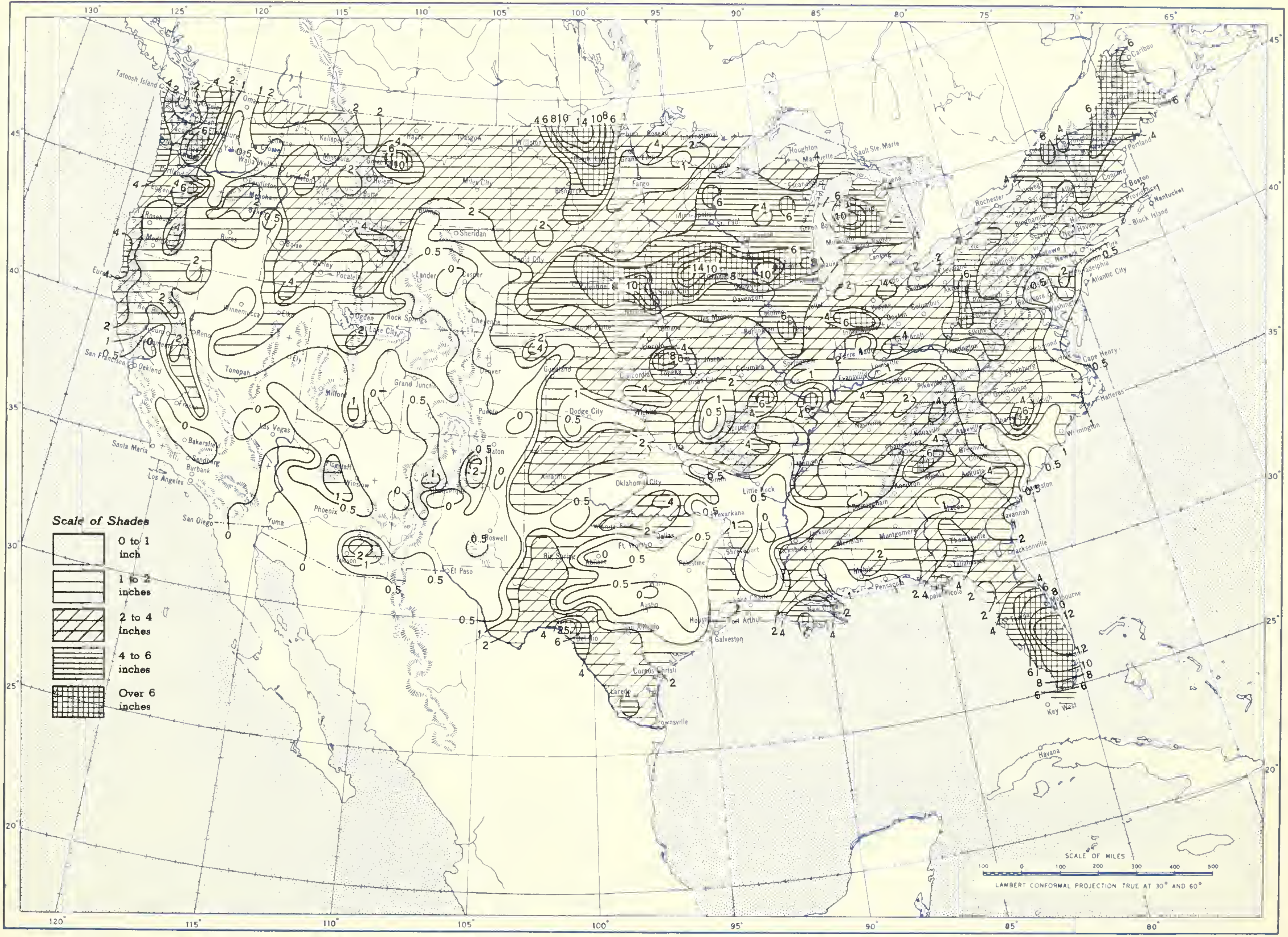


B. Departure of Average Temperature from Normal (°F.), June 1954.



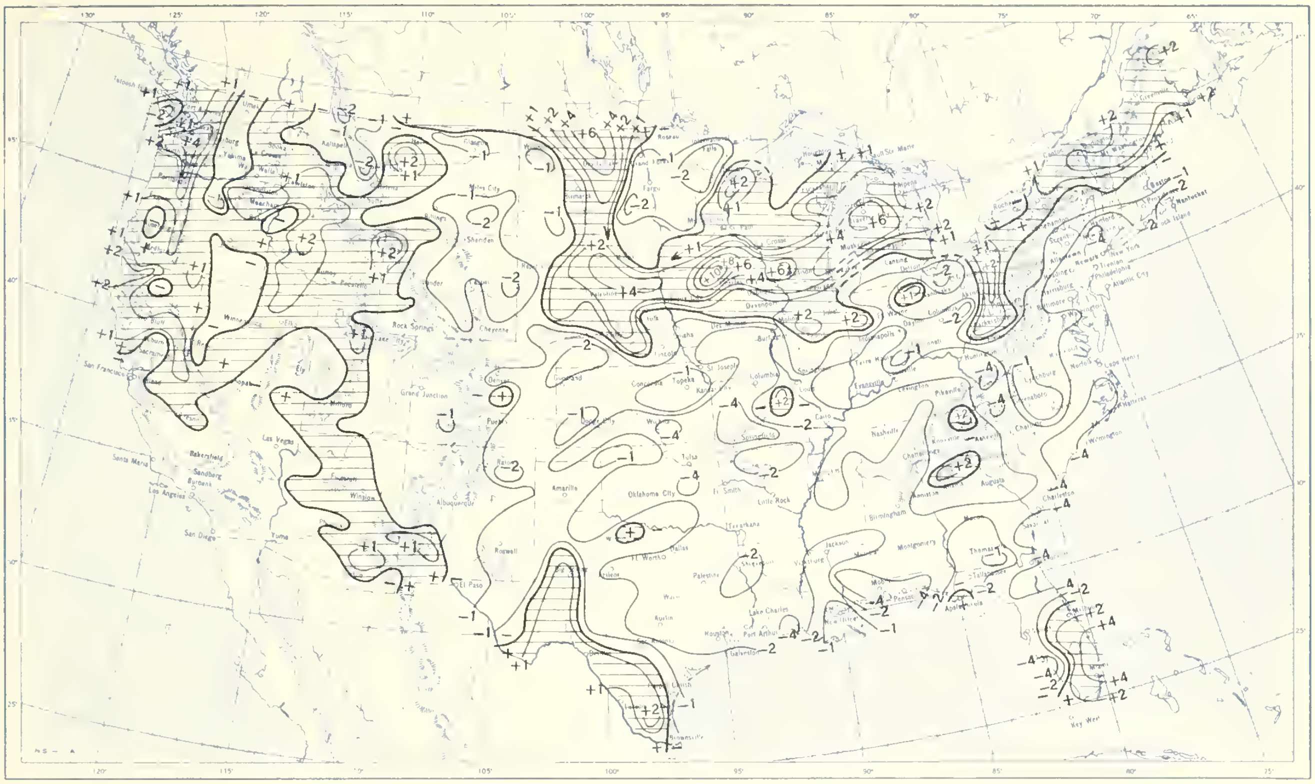
A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.
B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), June 1954.

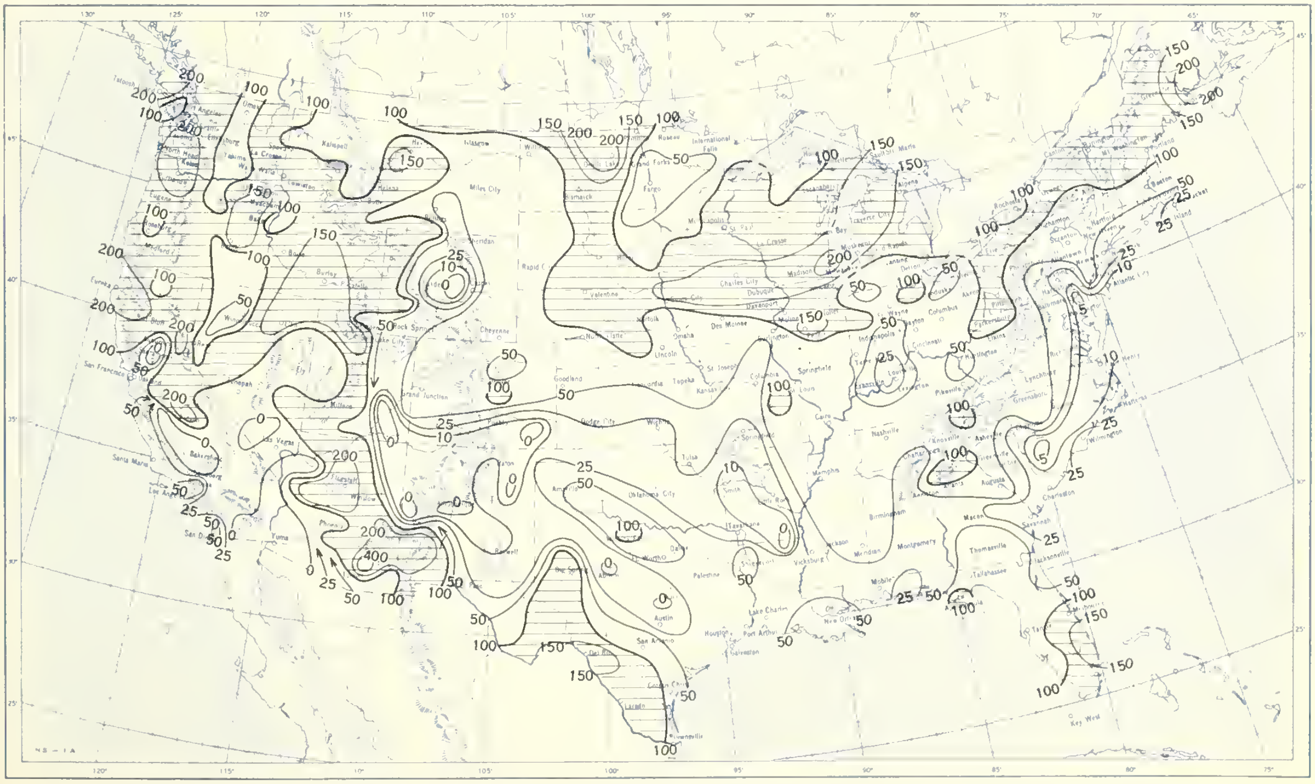


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), June 1954.

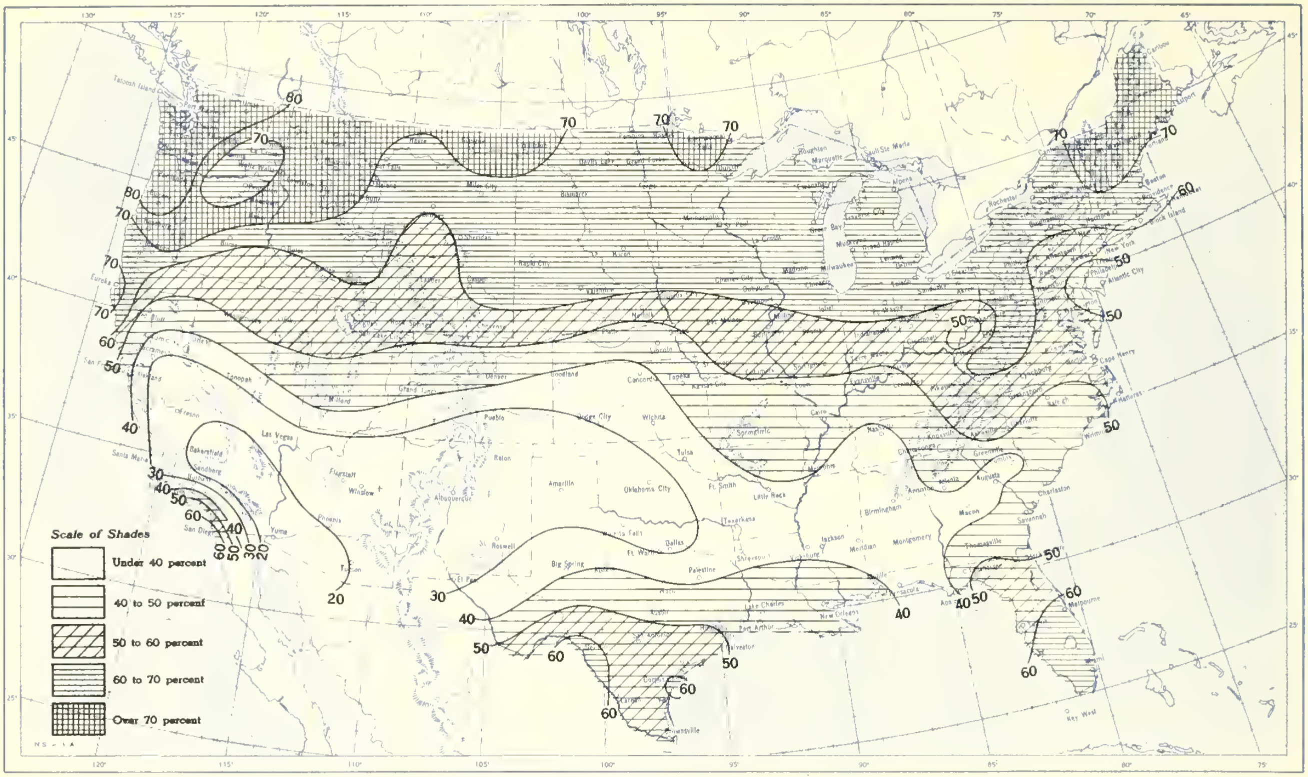


B. Percentage of Normal Precipitation, June 1954.

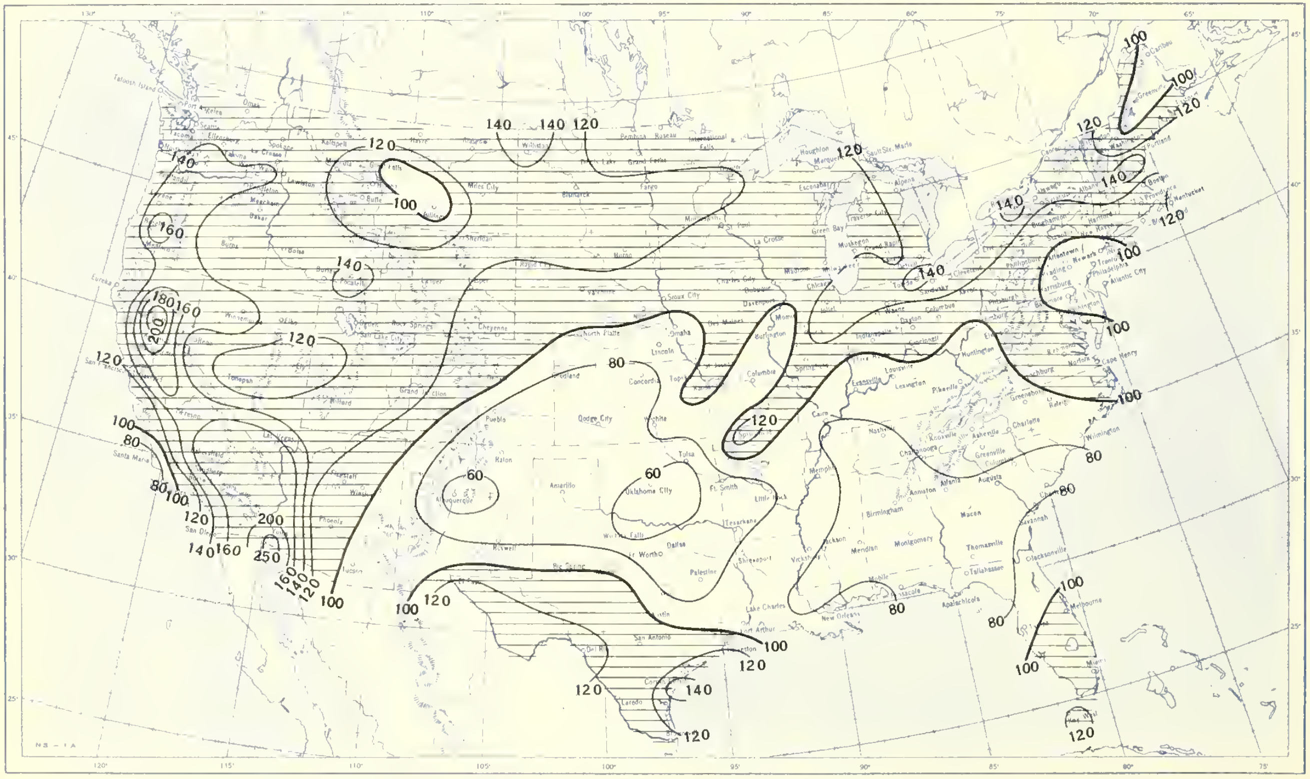


Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, June 1954.

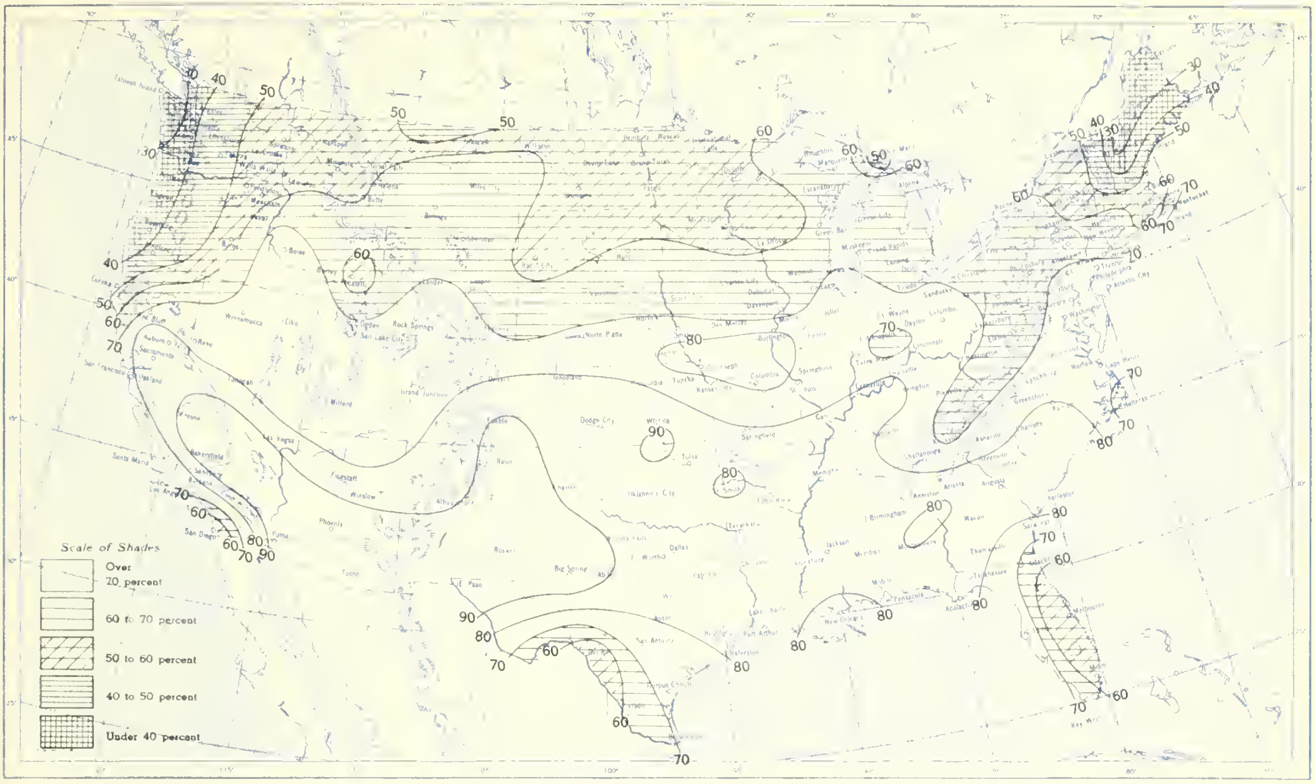


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, June 1954.

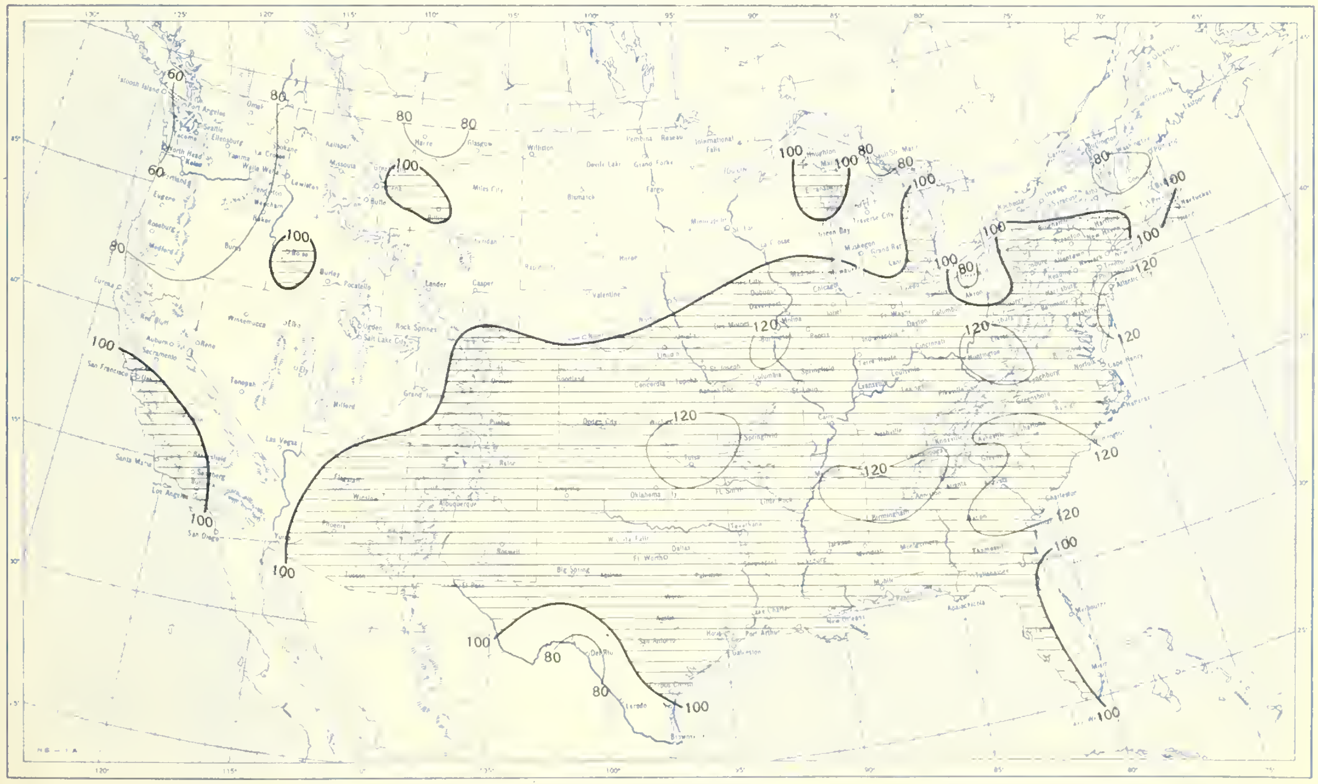


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, June 1954.



B. Percentage of Normal Sunshine, June 1954.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, June 1954. Inset: Percentage of Normal Average Daily Solar Radiation, June 1954.

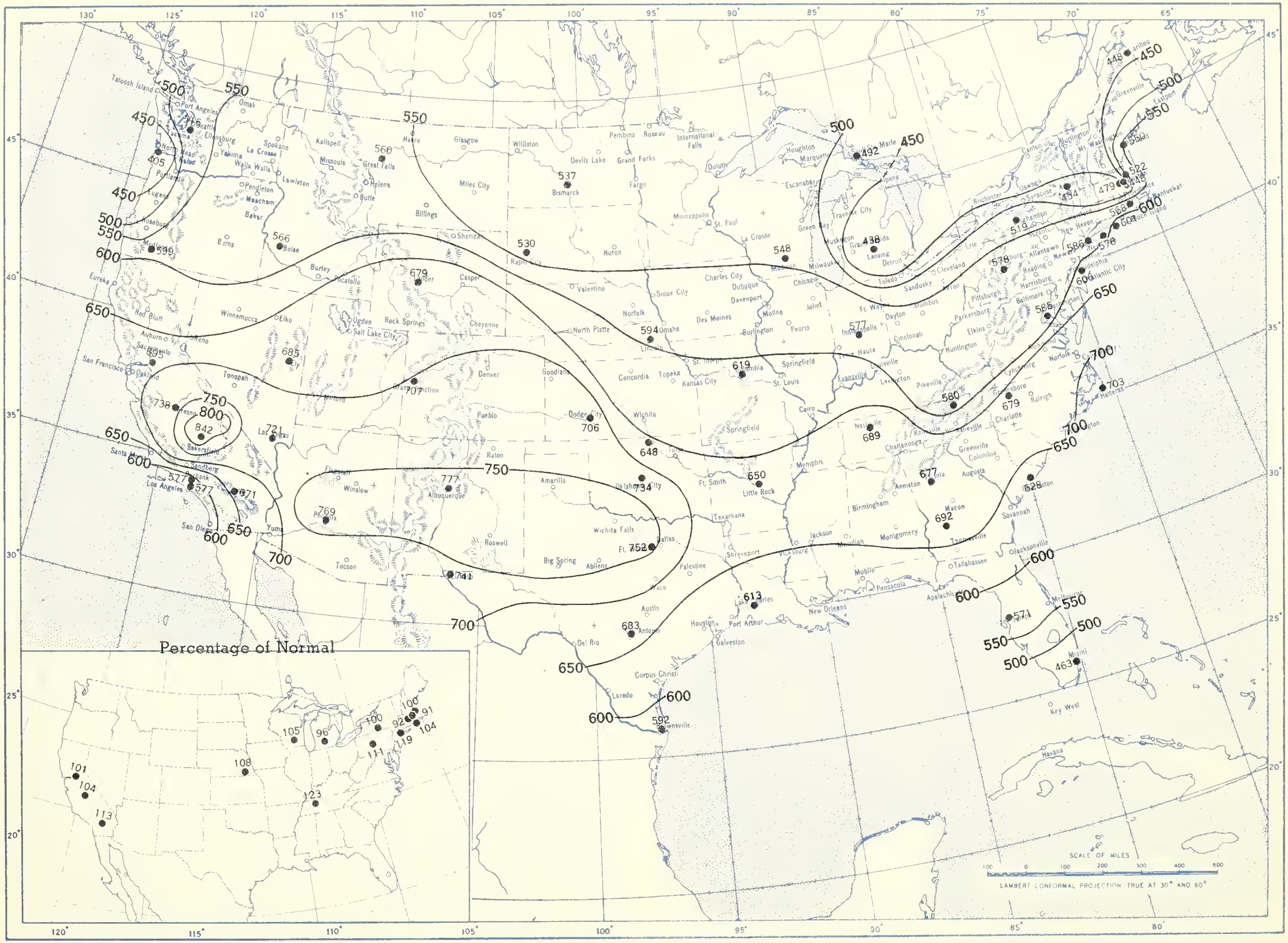
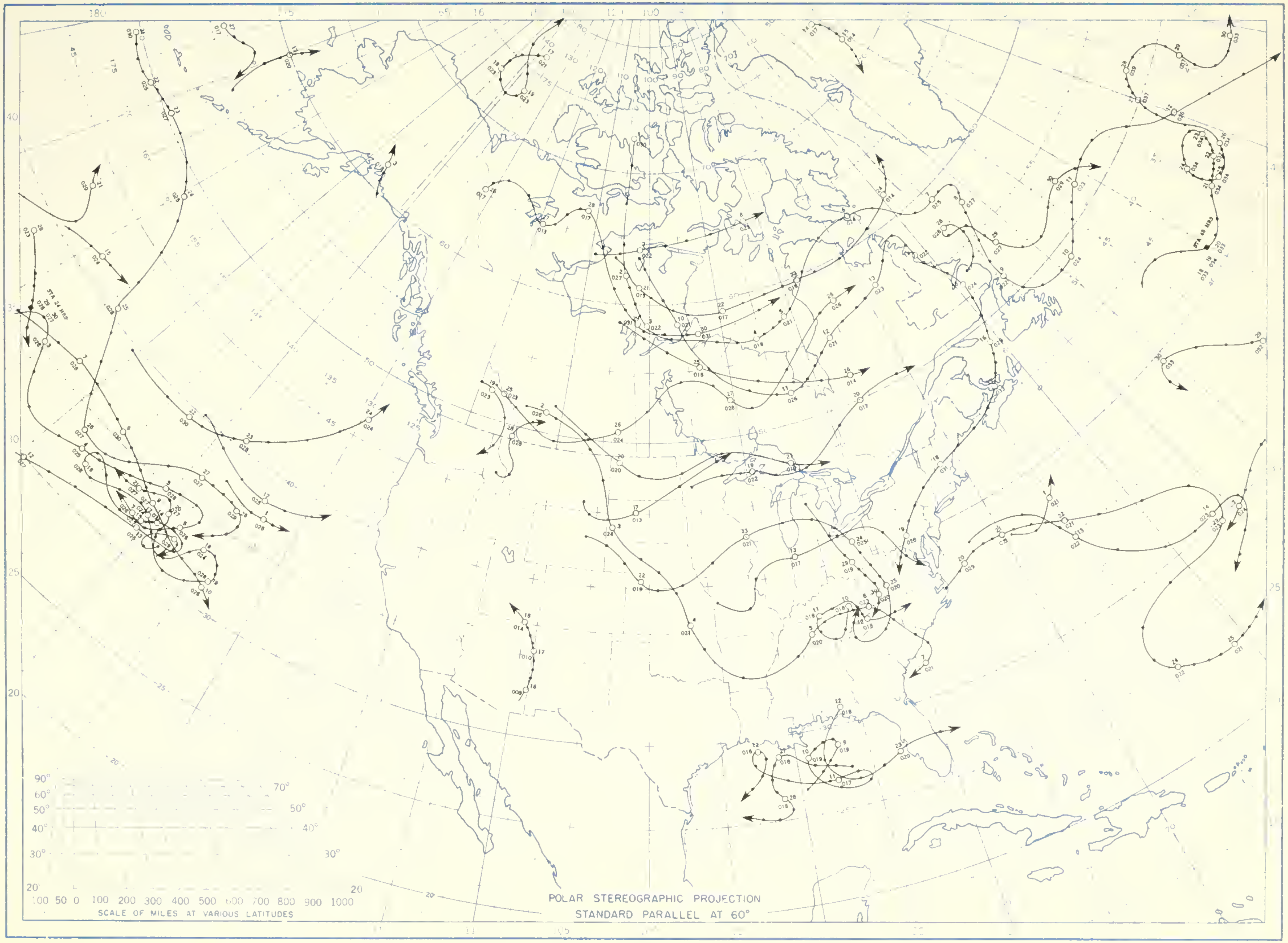


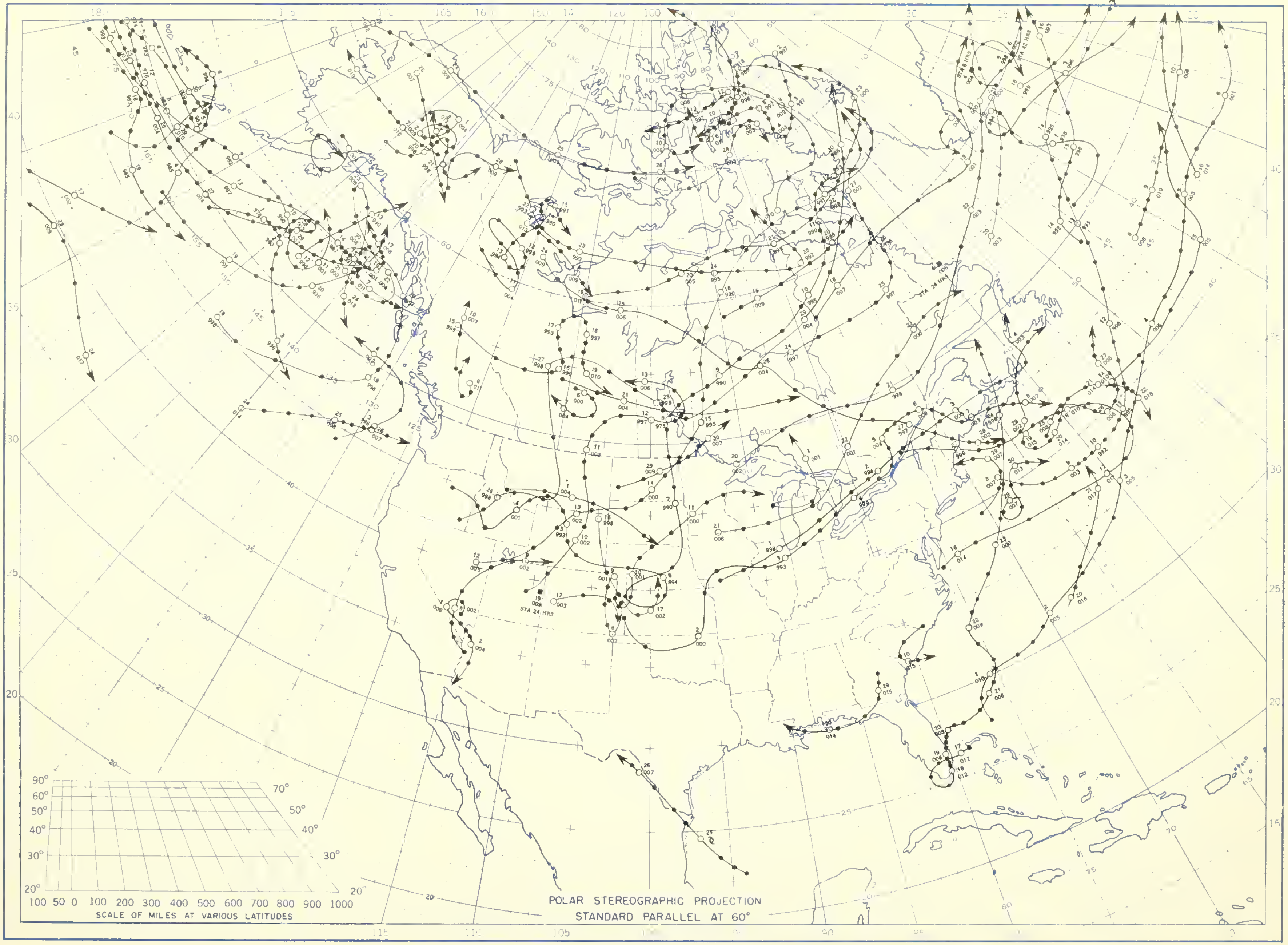
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm.$^{-2}$). Basic data for isolines are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are computed for stations having at least 9 years of record.

Chart IX. Tracks of Centers of Anticyclones at Sea Level, June 1954.



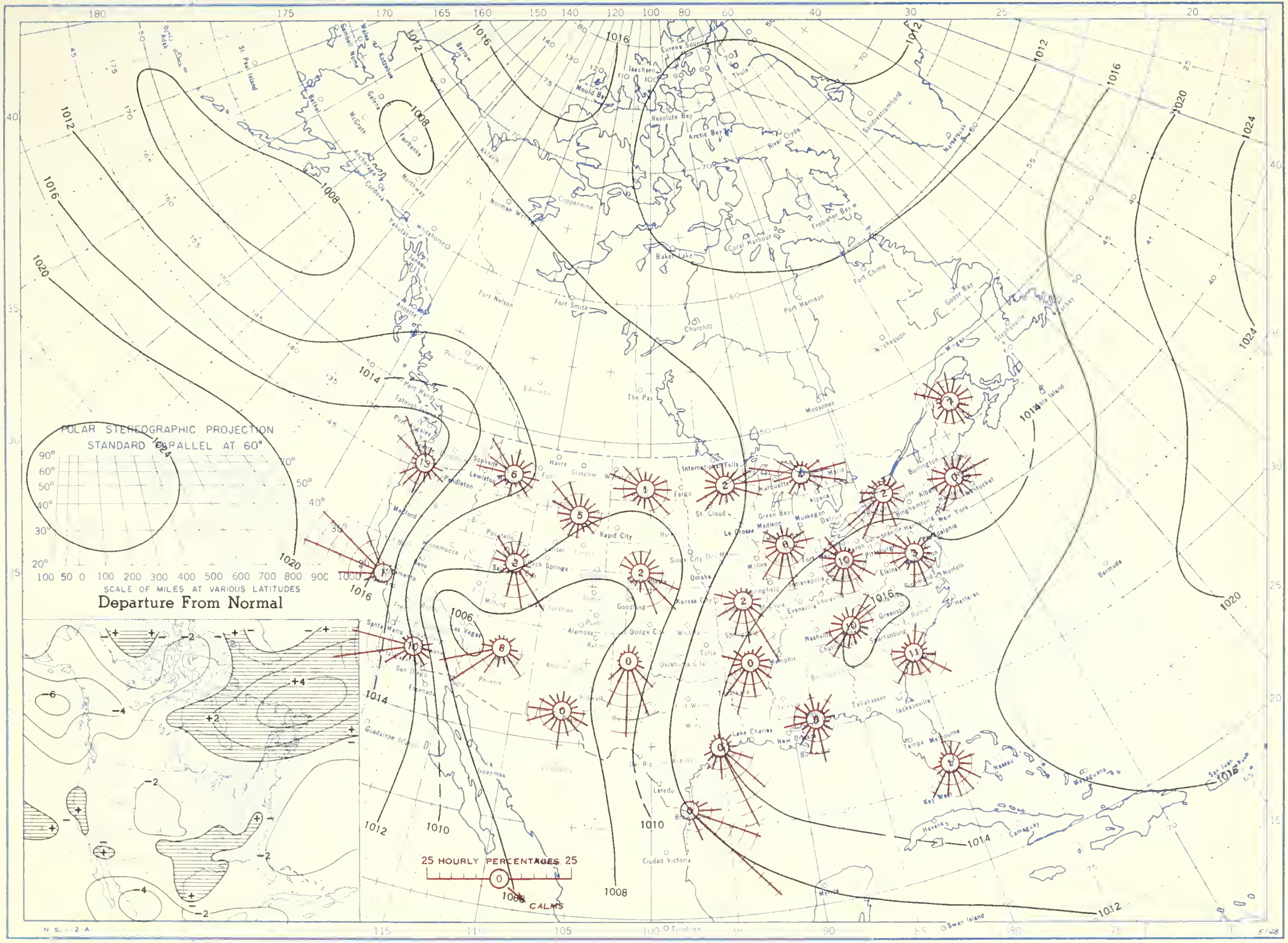
Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

Chart X. Tracks of Centers of Cyclones at Sea Level, June 1954.



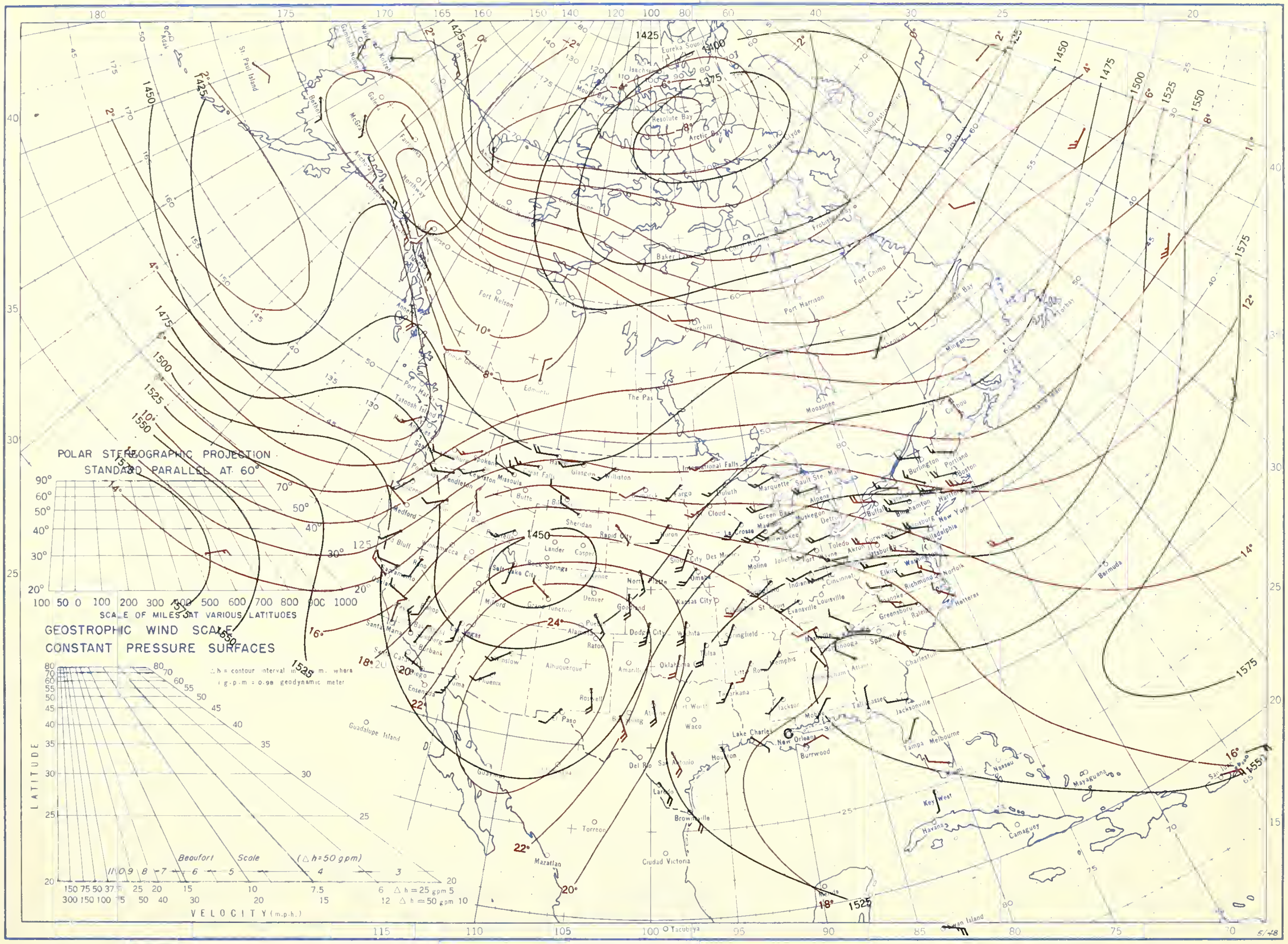
Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, June 1954. Inset: Departure of Average Pressure (mb.) from Normal, June 1954.



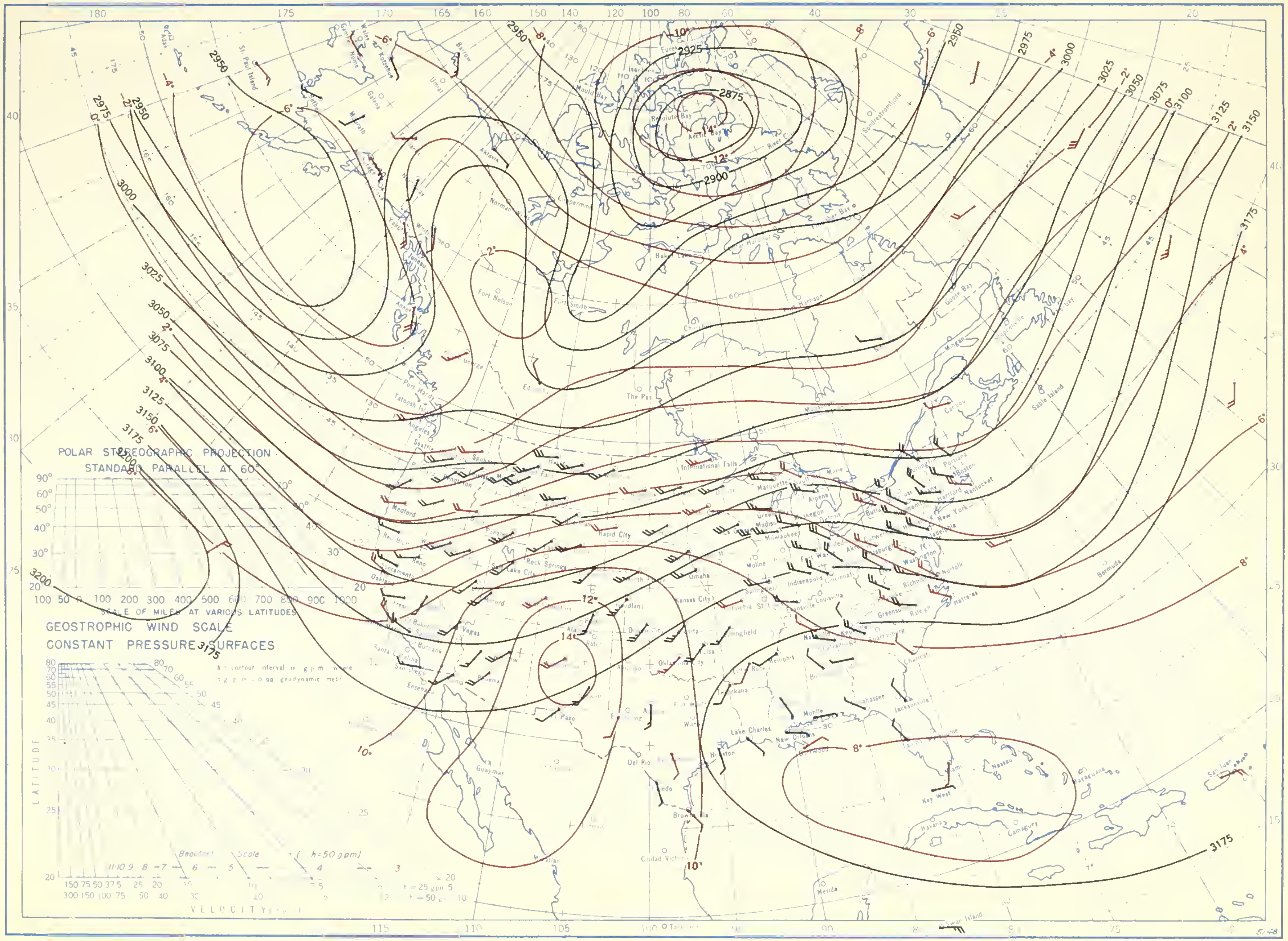
Average sea level pressures are obtained from the averages of the 7:30 a.m. and 7:30 p.m. E.S.T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), June 1954.



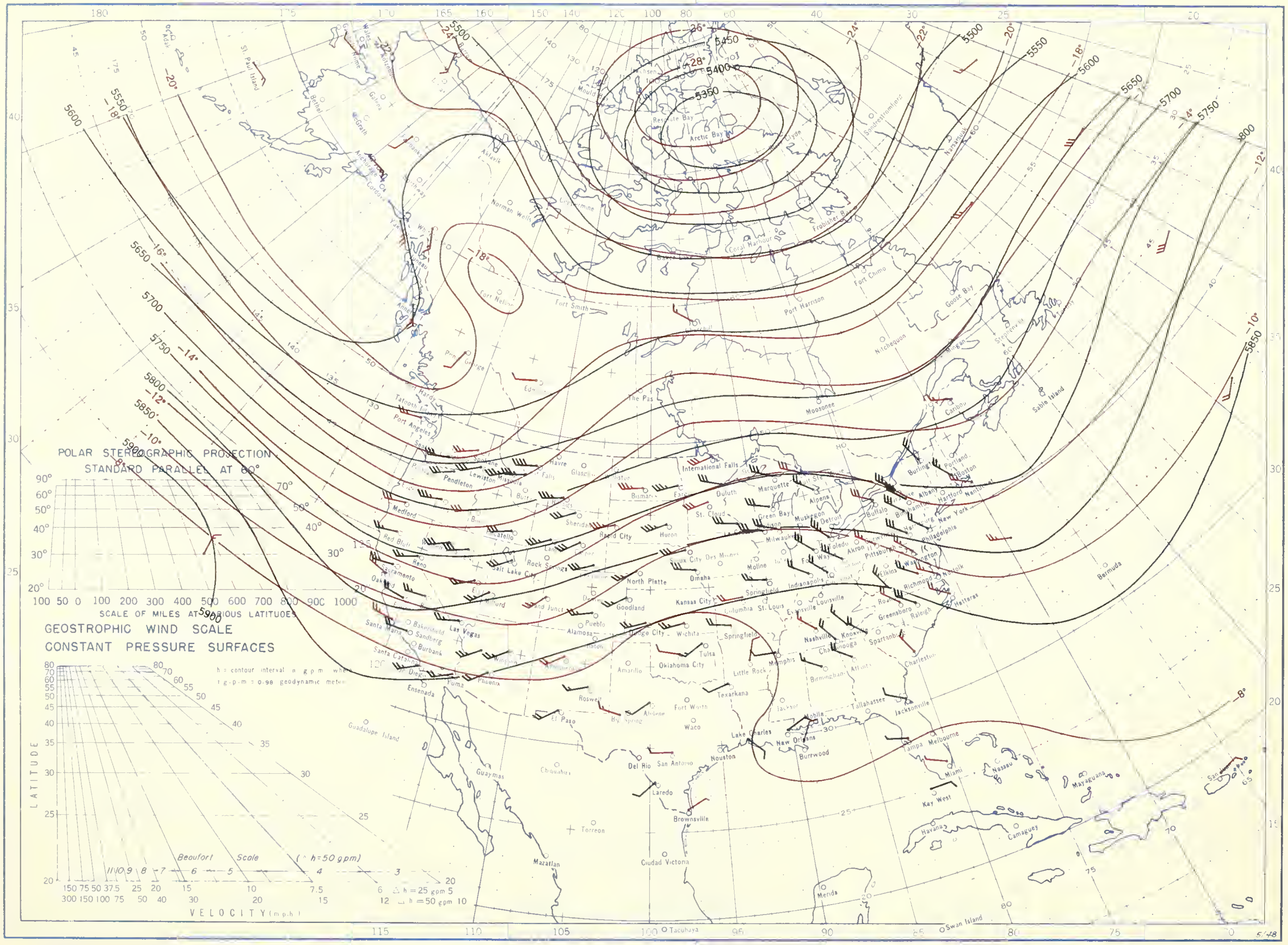
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m.. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), June 1954.



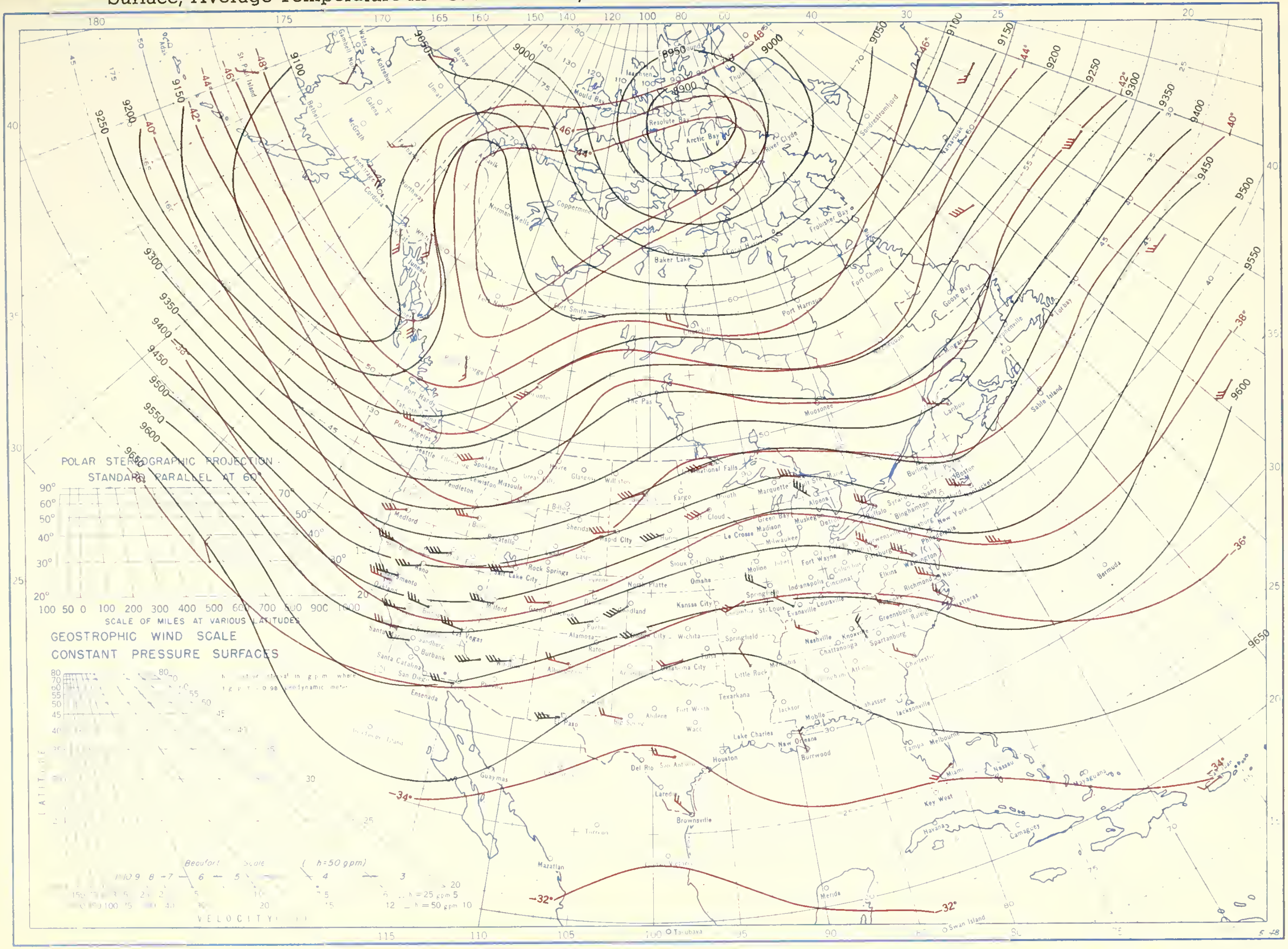
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), June 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 300-mb. Pressure Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), June 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

JULY 1954
Volume 5 No. 7

ASHEVILLE: 1954

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NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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CLIMATOLOGICAL DATA
NATIONAL SUMMARY

Volume 5 No. 7

JULY 1954

GENERAL SUMMARY OF WEATHER CONDITIONS

Drought and extreme heat in middle and southern areas east of the Rocky Mountains characterized the weather of July. In nearly all of this large area most crops steadily declined and in some sections were damaged severely. Several cities and towns in Oklahoma and South Carolina resorted to water rationing as supplies dwindled. The intense heat was blamed for the death of 94 persons in Missouri and 60 in Oklahoma, as well as for considerable losses of hogs and poultry in both Missouri and Nebraska. About the only areas in the entire southern half of the Country fortunate enough to receive above normal rainfall for the month were Arizona and a few adjacent areas of surrounding States, the Florida Peninsula, and the central Gulf Coast where the monotony of the heat and drought was broken by the tropical storm "Barbara" on the 28th and 29th.

In Canadian Border regions precipitation totals were extremely variable and in some sections they were much below normal for the first month this year, but thanks to near normal average monthly temperatures and good subsoil moisture reserves, crops remained in good condition.

Thunderstorms were abnormally frequent in Washington, North Dakota, eastern New York State, and New England, but fewer than usual occurred elsewhere except at a few widely scattered stations. Some were severe in the upper Mississippi Valley and Northeast, causing property damage amounting to several million dollars. In the vicinity of Tucson, Ariz., thunderstorms were observed every day of the month except the 15th.

Sunshine was below normal in western Washington and Oregon, at a few stations in the upper Mississippi Valley, and in New England, but well above normal in most of the remainder of the Country. Indianapolis, Ind., had 89 percent of possible (a July record) and El Paso, Tex., 90 percent, which equaled the July record there.

PRECIPITATION.--Nationwide precipitation averages dating back to 1893 indicate that next to July 1931 this was the driest July on record. The lack of rain had its worst effect in the southern two-thirds of the area east of the Rocky Mountains where rainfall in many sections had been below normal for the previous months of 1954 and subsoil moisture had never been fully replenished since the summer and fall drought of 1953. In nearly all of this region July rainfall was less than 50 percent of normal and in some sections less than 25 percent. Also in many localities the accumulated deficiency since the first of the year exceeded 50 percent. At Springfield, Mo., July was the 27th of the last 32 months with deficient moisture; the shortage since December 1953 amounted to 38.47 inches, and droughty conditions there at the end of the month were being described as the worst ever known. The total for the period January through July at Montgomery, Ala., was 15.91 inches, 17.52 inches below normal and the least amount for a similar period in 83 years of record. For the 2-month period of June and July Richmond, Va., had a total of 2.39 inches, the least of record there for this period since 1872. A total of 15.67 inches for the first 7 months of the year at Baltimore, Md., was the least of record there for the period, and while rainfall was near normal during the first half of July, it followed the driest June of record, so that the lack of rain and the extreme heat during the latter part of the month produced an extremely critical droughty condition. Similar conditions existed along the Atlantic Coast from northern Florida to New York City where a total of 14.46 inches since January 1 was the lowest of Weather Bureau records which began there in 1871, although among still older records there were lower totals in 1860 (13.62 inches) and 1849 (13.33 inches).

Of the major crops suffering drought damage, corn was the hardest hit. In the central and lower Great Plains much of this crop, too severely damaged to make grain, had to be cut for silage. The condition of corn in Missouri was reported to be the worst since 1936, and in Georgia it was estimated that the crop had been cut 50 percent by midmonth. Even cotton, more drought-resistant than most other crops, was suffering by the end of the month and in Georgia its condition ranged from 25 to 50 percent of normal.

The heaviest rainfall of the month, associated with tropical storm "Barbara" on the 28th and 29th, was responsible for above-normal monthly amounts in southern Mississippi, east-central and southern Louisiana, and the upper Texas coast. During the storm, Franklin, La., and Satsuma, Tex., measured 24-hour amounts of 11.55 and 11.33 inches, respectively. Highest monthly totals in the storm area ranged up to 18.85 inches at Houma, La., 14.41 at Satsuma, Tex., and 13.04 inches at Shubuta, Miss.

TEMPERATURE.--In the Central and Southern Interior the extreme and persistent heat during July was centered over an area comprising parts of Texas, Oklahoma, Kansas, Missouri, and Arkansas where high extremes and average temperatures for the month set numerous new records. Statewide averages for Oklahoma and Arkansas, 88.8° and 85.8° respectively, were higher than for any other month on record. Also, the highest July temperature ever recorded in Arkansas, 116° at Jonesboro on July 12, 1901, was equaled at Ozark on the 13th, and the record extreme for Missouri, 118°, last recorded at Lamar July 18, 1936, was equaled at Union and Warsaw on the 14th. Outside this area many stations also had their hottest July on record, among which were Houston, Tex., 84.8°; Macon, Ga., 84.0°; Lander, Wyo., 74.8°; and San Diego, Calif., 71.0°; and on the 14th a new all-time record high for the state of Illinois was established when East St. Louis recorded 117°, which exceeded by 2° the previous record at Greenville on July 12, 1936. In Virginia 110° at Balcony Falls on the 15th tied the all-time state high recorded at Columbia July 5 and 7, 1900.

The persistence of the heat is indicated by the following station records: For the first time of record in July, Ft. Worth, Tex., had a total of

25 days, 20 of them consecutive, with maximum temperatures of 100° or above. There were 17 days with high temperatures of 100° or above at Shreveport, La., and only 2 days on which the temperature failed to reach 90°. At Wichita, Kans., maximum temperatures equaled or exceeded 100° on 20 days and exceeded 90° on the remaining days. Twenty-eight days with maxima of 90° or above was a new July record for Louisville, Ky. At Fort Smith, Ark., 100° or more was reached or exceeded on 22 days; the lowest maximum was 93° and the average maximum for the month was 102.2°. At Springfield, Mo., the maximum temperature was above 90° every day except the 26th. At Cordova and Geneva, Ala., maximum temperatures exceeded 90° every day.

In contrast to the record-breaking heat in central and southern areas, the weather, temperaturewise, was pleasant and somewhat on the cool side in most northern areas, particularly from the Great Lakes eastward and west of the Continental Divide. At Yakima, Wash., the monthly average was 66.6°, the second lowest for July there on record. The average for Portland, Oreg., 64.3°, was the lowest July average since 1916, and the monthly maximum of 81° on the 13th and 31st was the lowest July maximum in the past 84 years. Elko, Nev., had a minimum temperature of 35° on the 22d when frost damaged some gardens and flowers in the nearby vicinity. Frosts continued to plague potato growers in the Klamath Basin of Oregon. On the 22d and 23d frost also was reported at higher elevations near Pocatello, Idaho. A low of 24° at Wilkins, Nev., on the 22d was only 1° short of the State record for July. From the Great Lakes eastward the nights were particularly cool and there were no unusually hot days. Freezing occurred at some points in Wisconsin (Long Lake Dam 32° on the 22d), Michigan (Grand Marais 32° on the 3d and Vanderbilt 31° on the 8th), and New York State (as low as 29° in the Adirondacks on the 10th).

The highest temperatures occurred in the central portions of the Intermountain region and Great Plains on the 11th and 12th, and from a line joining Omaha, Nebr., and Fort Smith, Ark., eastward to the Appalachians on the 13th and 14th, in the Pacific Northwest during the first week, in the Southwest during the last week, and elsewhere on various dates. Lowest temperatures occurred in the western half of the Nation either at the beginning of the month or early in the 3d decade, from the Mississippi Valley to the Appalachians during the latter part of the first decade, and in the Atlantic States about midmonth. Extremes for the month ranged from 123° at Greenland Ranch, Calif., on the 31st to 22° at Bondurant and Kimball, Wyo., on the 22d, Seneca, Oreg., on the 22d, and Three Creek, Idaho, on the 22d and 23d.

Compared to nationwide averages dating back to 1893, this has been the warmest July since the record warm July in 1936. Previous to 1936, 1901 and 1934 were also warmer and 1931 equally warm.

SEVERE STORMS.--Severe storms during July were responsible for the death of 56 persons, injuries to 215 others, and material losses of more than $44 million. About a third of the total damage for the month was caused by widespread thunderstorm activity in the Northeast during a frontal passage on the 14th. In Pennsylvania alone losses were estimated at $10 million, and damage of $1,500,000 was reported in New York State, $1,250,000 in New England, and $1,000,000 in eastern Ohio.

On the 5th wind- and hailstorms caused $5,000,000 crop losses and $200,000 property damage in North Carolina, and $1,000,000 damage in Baltimore, Md., and vicinity. On the 8th hail damaged nearly ripened wheat to the extent of $2,000,000 in Judith and Cascade Counties, Mont., and on the 6th another $1,000,000 in Kenosha County, Wis.; also on the 6th severe thundersqualls damaged property to the extent of $1,000,000 in northern Illinois, and a few hundred thousand dollars in northern Indiana. In Aurora, Hoffman, and Arapahoe Counties, Colo., hail and flood producing rains resulted in $1,000,000 damage on the 27th, and in the Richwood, W. Va., area flood producing rains caused over $2,000,000 losses on the 18th and 19th.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1 JULY 1954

Section	Temperature								Precipitation					
			Monthly extremes								Monthly extremes			
	Average	Departure from normal	Station	Highest	Date	Station	Lowest	Date	Average	Departure from normal	Station	Greatest	Station	Least
	°F.	°F.		°F.			°F.		In.	In.		In.		In.
Alabama	82.8	2.5	Belle Mina 2N	107	13	Valley Head	55	1	3.51	-1.95	Slocomb 4S	9.99	Valley Head	0.66
Arizona	81.1	.9	Davis Dam	118	28	Groom Creek	36	16	2.45	.78	Patagonia	9.26	Parker	T
Arkansas	85.8	5.3	Ozark	116	13	Batesville Livestock	53	10	1.55	-2.19	Ashdown	5.14	Dardanelle	.03
California	76.7	1.0	Greenland Ranch	123	31	Mount Hebron RS	27	21	.13	.03	Cuyamaca	2.14	251 Stations	.00
Colorado	71.2	3.8	Sedgwick	114	11	Dillon 1S	31	3	2.04	.02	Lake Moraine	7.58	Northdale	.21
Connecticut	69.7	-.4	Waterbury City Hall	99	15	Mansfield Hollow Dam	37	17	2.99	-.93	Cream Hill	5.99	Bridgeport WB AP	.82
Delaware	76.1	.0	Newark College Farm	103	31	Laurel 2SW	50	12	3.06	-1.60	Bridgeville	6.08	Wilmington Porter Res.	1.18
Florida	81.8	.5	Monticello	102	21	Hilliard	58	30	7.59	.13	Captiva	19.39	Jacksonville Beach	.76
Georgia	82.5	2.2	2 Stations	107	7+	Blairsville Exp. Sta.	49	7	3.50	-2.31	Concord	10.99	2 Stations	.96
Idaho	69.3	.9	Grand View	107	4	Three Creek	22	22+	.58	-.03	Clark Fork 1ENE	2.59	5 Stations	.00
Illinois	79.3	2.9	E St Louis Parks Col	117	14	2 Stations	47	8	2.79	-.44	Chicago University	6.37	Waterloo	.42
Indiana	76.9	1.3	2 Stations	109	14	Wheatfield	45	8	3.24	-.09	Richmond Airport	8.70	Columbus	.57
Iowa	77.4	2.5	Red Oak	108	13	Sibley	49	24	1.79	-1.82	Titonka 6NE	5.83	Bartlett 3E	T
Kansas	85.6	6.0	Fort Scott	120	13+	Tribune 1W	54	23	1.50	-1.45	Topeka WB AP	5.21	2 Stations	T
Kentucky	79.2	2.1	Shelbyville 2W	107	14	Farmers	47	9	2.86	-1.26	Jackson	7.97	Shawnee Steam Plant	.17
Louisiana	83.8	1.6	Logansport	109	25	5 Stations	65	2+	6.04	.49	Houma 1	18.85	Robeline	.06
Maine	65.2	-1.9	Sanford 2NNW	89	14+	Greenville	38	10	3.73	.36	Fort Fairfield	7.44	Jonesboro	1.89
Maryland	75.9	.6	6 Stations	105	14+	Oakland 1SE	40	16	2.45	-1.00	Cumberland	4.74	Elkton	.60
Massachusetts	69.0	-1.5	4 Stations	96	15+	West Cummington	37	17	2.57	-.92	Ware	5.29	North Truro	.83
Michigan	67.5	-1.5	3 Stations	98	13+	Vanderbilt Trout Sta	31	8	2.14	-.60	Three Rivers	6.24	Whitefish Point	.26
Minnesota	70.3	.5	Tracy Power Plant	104	13	2 Stations	39	1	3.09	-.23	Leech Lake Dam	9.52	Tyler	.60
Mississippi	83.7	2.6	Eupora	107	16	2 Stations	60	1+	3.85	-1.18	Shubuta	13.04	Greenville	.43
Missouri	84.2	6.5	2 Stations	118	14	Hermitage	50	9	1.40	-2.14	Willow Springs	5.76	Joplin CAA AP	.06
Montana	69.2	.8	Milles City	110	5	Jackson	25	22	.93	-.46	Plentywood	4.68	Broadview	.00
Nebraska	80.3	4.9	2 Stations	116	11	Box Butte Exp Farm	40	23	1.27	-1.82	Gordon	4.45	Whitman 4E	.11
Nevada	74.9	1.4	Overton	118	30	Wilkins	24	22	.41	.02	Searchlight	2.10	10 Stations	.00
New Hampshire	65.8	-2.3	Windham	93	31	Fabyan	33	10	3.25	-.44	Cannon Mountain	6.94	West Lebanon	1.37
New Jersey	74.0	.0	4 Stations	104	31	Charlotteburg	39	17	1.70	-3.00	Cape May 3W	3.27	Sandy Hook	.71
New Mexico	75.5	2.0	Dunlap	109	27	3 Stations	35	6+	1.83	-.43	Chacon	5.47	2 Stations	.00
New York	67.9	-1.4	2 Stations	104	14	Speculator	29	10+	2.11	-1.75	Greenfield Center	5.93	Morrisville Agr. Inst	.23
North Carolina	78.3	.9	Reidsville	108	14	Banner Elk	41	12	4.24	-1.77	Hatteras WB City	10.27	Old Fort	.60
North Dakota	70.4	.8	Fort Yates	107	9	Powers Lake 1N	35	1	1.92	-.55	Gackle	7.23	2 Stations	.44
Ohio	73.3	-.4	Cincinnati WB City	107	14	2 Stations	40	9	3.36	-.41	Hillsboro	8.80	Hiram	.33
Oklahoma	88.8	6.5	2 Stations	118	14+	Kenton	58	4	.61	-2.18	Fanshawe	6.06	Several	.00
Oregon	64.9	-2.0	Huntington	107	14	Seneca	22	22	.34	-.10	Headworks Ptld Wtr	3.28	37 Stations	.00
Pennsylvania	71.2	-1.0	3 Stations	104	14+	3 Stations	36	9+	2.35	-1.94	Johnstown	5.12	Chedds Ford	.70
Rhode Island	68.8	-1.6	Providence WB AP	94	14	Kingston	44	12	3.15	.22	Greenville	3.76	Kingston	2.55
South Carolina	81.9	2.0	Tilghman Forest Nrsy	107	7	Blackville 3W	54	18	3.64	-2.22	Yemassee 4W	9.09	Cleveland 2WNW	.30
South Dakota	76.2	3.1	Ardmore	114	12	Deerfield Dam	32-	31	1.38	-1.04	Salem	5.81	Glad Valley	.01
Tennessee	81.5	3.6	2 Stations	107	13+	2 Stations	51	1+	2.40	-2.07	LaFollette	8.17	Lantana	.15
Texas	85.4	3.0	4 Stations	114	26+	Mount Locke	51	1	.91	-1.59	Houston Satsuma	14.41	Several	.00
Utah	74.0	2.1	2 Stations	109	12+	3 Stations	30	22+	.80	-.16	Moon Lake	2.75	Callao	.00
Vermont	65.1	-2.7	Vernon	94	15	Somerset	34	17	3.08	-.73	Bloomfield	5.75	Essex Junction	1.53
Virginia	75.9	.6	Balcony Falls	110	15	Chilhowie 1S	46	8	3.67	-.93	Tazewell	8.23	Timberville 2N	1.08
Washington	63.4	-3.3	Trinidad 2SSE	103	4	Rainier Paradise RS	28	2	1.11	.46	Index	4.30	White Swan	T
West Virginia	72.4	-.7	Berkeley Springs	107	14	Canaan Valley	37	9+	5.88	1.28	Camden on Gauley	12.18	Omps	2.04
Wisconsin	69.9	-.2	2 Stations	98	12+	Long Lake Dam	32	22	3.88	.46	Necedah 2 NNW	7.85	Port Wing	1.43
Wyoming	70.9	4.5	Redbird	112	12	2 Stations	22	22	.98	-.28	Lingle 2S	3.93	Weston	.00
Puerto Rico	77.4	.3	San German	97	15	Coloso	58	12	5.90	-.27	Bayamon (Hato Tejas)	14.89	San Lorenzo (Valdes Farm)	1.20

+ Other dates also.

Note: Dates in Table 1 apply to the period 24 hours prior to time of observation. In some cases the actual occurrence is on the calendar date preceding that shown. (See individual Climatological Data for times of observations).

Table 2

State and station	Elevation (ground)	Pressure		Temperature										Average dew point	Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days				Total	Departure from normal	Greatest in 24 hours	No. of days		Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile			Clear	Partly cloudy	Cloudy		
												Max. 90° F. or above	Min. 32° F. or below						.01 inch or more	With thunderstorms	Total	Max. depth on ground			Speed	Direction	Date					
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.		--	0–3	4–7	8–10	0–10	%
ALABAMA																																
Birmingham	610	990.9	1015.6	95	72	83.7	4.1	103	1	67	29	30	0	68	64	3.58	-1.53	1.50	10	12	T	T	5.1	SW	36	SE	14	10	14	7	5.1	79
Mobile	211	1008.8	1016.5	93	73	83.1	2.4	98	16+	69	9	27	0	73	79	7.66	-1.31	2.89	15	24	.0	0	8.6	W	--	---	--	2	21	8	6.3	--
Montgomery CO	201	------	------	94	74	83.8	2.3	100	31+	71	29+	27	0	--	--	2.91	-2.24	.62	9	--	T	T	----	---	--	---	--	--	--	--	---	--
Montgomery	198	1008.5	1015.6	95	73	83.9	2.7	100	31+	67	29	29	0	71	71	3.38	-2.38	1.84	8	17	T	T	7.6	SW	51	E	14	6	17	8	5.7	71
ARIZONA																																
Flagstaff	6993	------	------	81	52	66.5	1.3	87	7+	45	5+	0	0	--	--	3.51	1.02	.90	12	20	T	T	----	---	--	---	--	5	15	11	6.1	--
Phoenix	1114	970.9	1008.8	103	80	91.3	1.2	112	28	75	13+	30	0	64	45	.36	-.34	.15	7	9	.0	0	6.8	S	*40	SSE	12+	13	11	7	4.6	88
Prescott	5014	849.0	1012.4	90	63	76.6	.6	99	7+	59	5+	21	0	--	--	2.16	-.55	.83	12	20	T	T	5.8	SW	30	SE	9	6	15	10	6.0	69
Tucson	2558	924.1	1009.8	99	75	86.8	.6	108	28	69	16	30	0	60	47	2.03	.23	.76	14	20	.0	0	7.4	ESE	44	S	10	9	13	9	5.7	77
Winslow	4880	853.0	1010.4	93	64	78.6	1.4	100	31	58	5+	25	0	52	47	2.50	1.26	.78	11	17	.0	0	8.6	SE	*59	SSE	16	12	9	10	4.9	--
Yuma	199	1003.1	1008.1	107	81	94.3	-.3	116	28	76	24	31	0	63	40	.10	-.13	.08	2	5	.0	0	11.8	SE	34	S	7+	19	10	2	3.3	86
ARKANSAS																																
Fort Smith	458	997.0	1013.2	102	74	88.1	5.8	111	13+	69	7	31	0	66	53	.74	-1.82	.25	7	6	.0	0	7.5	NE	37	NE	5	13	13	5	4.5	77
Little Rock	257	1001.4	1014.0	99	75	86.7	4.8	107	15	69	10	30	0	69	59	1.27	-1.83	.76	5	6	T	0	8.7	SW	29	S	18	14	9	8	4.7	79
Texarkana	361	1001.0	1014.3	99	75	86.8	3.9	105	17+	71	9+	30	0	70	60	1.94	-2.00	1.00	4	8	.0	0	----	---	--	---	--	10	13	8	5.2	--
CALIFORNIA																																
Bakersfield	489	993.6	1011.1	100	69	84.1	-.1	106	28+	60	9	31	0	53	36	.00	-.01	.00	0	0	.0	0	6.3	WNW	*20	NNW	4+	26	3	2	1.5	--
Bishop	4108	873.0	1010.5	99	56	77.4	1.9	104	29+	47	5	31	0	--	--	.16	.06	.10	3	5	.0	0	----	---	--	---	--	20	6	5	2.7	--
Blue Canyon	5280	841.5	1012.2	79	60	69.6	1.8	85	23+	49	1	0	0	--	--	T	-.03	T	0	0	.0	0	----	---	--	---	--	25	5	1	1.8	--
Burbank	699	986.1	1012.2	91	65	78.2	5.0	104	7	56	5	19	0	60	60	T	.00	T	0	0	.0	0	6.1	S	*17	S	20+	22	7	2	2.7	--
Eureka CO	43	1015.2	1017.6	60	52	55.6	-.8	73	6	48	[illegible]	0	0	--	--	.04	-.05	.03	2	0	.0	0	7.3	---	30	NW	21	8	5	18	7.0	43
Fresno	331	999.0	1010.5	98	65	81.4	-.7	106	28	56	9	30	0	50	37	T	-.01	T	0	0	.0	0	6.2	NW	23	NW	29	27	3	1	1.2	97
Los Angeles CO	312	------	------	87	66	76.7	4.2	96	7	59	2	14	0	62	66	T	.00	T	0	0	.0	0	5.1	---	18	W	26	20	9	2	2.9	82
Los Angeles	99	1008.5	1012.2	79	65	71.9	4.3	87	16	60	1+	0	0	62	76	.01	.01	.01	1	0	.0	0	6.8	WSW	%29	W	7	14	13	4	3.7	--
Mt. Shasta	3543	892.7	1014.5	85	50	67.1	-.1	94	31	41	2	10	0	--	--	.00	-.19	.00	0	0	.0	0	----	---	--	---	--	26	4	1	1.5	--
Oakland	3	1014.2	1014.6	73	55	64.2	1.5	96	28	51	3	2	0	53	72	T	-.01	T	0	0	.0	0	7.5	WNW	*25	WSW	8	20	10	1	2.7	--
Red Bluff	341	999.0	1011.3	99	66	82.4	-.8	108	28	59	5+	31	0	45	30	T	-.02	T	0	1	.0	0	8.9	SSE	28	SE	6	27	3	1	1.2	96
Sacramento	17	1010.5	1011.5	94	58	75.7	1.1	108	28	53	1+	22	0	51	48	.00	.00	.00	0	0	.0	0	9.3	SSW	27	SW	6	28	3	0	1.0	95
Sandberg CO	4517	863.9	1012.2	87	65	75.9	2.0	95	28	54	1	9	0	--	--	T	-.02	T	0	0	.0	0	----	---	--	---	--	24	5	2	1.9	--
San Diego	19	1008.8	1012.1	78	66	71.9	2.6	86	7	61	2+	0	0	63	76	T	-.01	T	0	1	.0	0	6.3	SSW	18	SW	29	10	13	8	5.2	62
San Francisco CO	52	------	------	65	53	59.1	.2	84	28	50	4+	0	0	--	--	.03	.02	.03	1	0	.0	0	11.6	---	30	W	4	16	13	2	3.6	71
San Francisco	1	1013.2	1014.1	72	51	61.8	1.4	89	22	45	[illegible]	0	0	52	78	.01	.00	.01	1	0	.0	0	15.2	WNW	38	W	20	21	9	1	2.5	--
Santa Maria	231	1005.1	1013.7	74	53	63.3	1.1	83	28	45	2	0	0	54	77	T	-.03	T	[illegible]	0	.0	0	5.8	W	*18	W	1+	25	5	1	2.5	--
COLORADO																																
Alamosa	7534	777.9	1019.4	82	50	65.9	1.8	88	13+	43	17+	0	0	--	--	1.77	.90	.72	11	12	T	0	----	---	--	---	--	5	15	11	6.1	--
Colorado Springs	6173	814.8	1014.3	89	59	74.0	2.8	100	13	55	23+	11	0	50	50	3.13	.41	1.28	12	21	T	T	10.2	NNW	*45	NNW	26	12	11	8	5.0	--
Denver	5292	840.2	1012.4	91	63	76.8	4.0	102	11	56	23	19	0	48	43	1.99	.63	1.15	[illegible]	13	T	T	11.6	S	41	NE	14	7	17	7	5.4	71
Grand Junction	4849	860.5	1012.2	93	67	79.9	1.7	101	31	61	5+	24	0	48	36	.40	-.39	.31	[illegible]	12	.0	0	9.9	ESE	47	SE	7	12	13	6	4.6	76
Pueblo	4639	858.1	1013.4	94	64	79.3	4.4	103	13	58	1	29	0	54	48	1.73	-.08	.74	[illegible]	15	T	T	8.5	SE	45	N	30	10	17	4	4.7	82
CONNECTICUT																																
Bridgeport	7	1012.5	------	82	63	72.6	-.2	94	30	55	5	4	0	--	--	.82	-3.15	.18	9	7	.0	0	----	---	--	---	--	12	10	9	5.4	--
Hartford	15	1007.5	1013.1	84	60	71.9	-.8	97	14	49	17	5	0	60	71	3.11	-.82	1.31	14	11	.0	0	6.2	S	29	NW	28+	6	12	13	6.0	71
New Haven	6	1008.8	1012.9	80	61	70.7	-.5	91	31	51	5	1	0	--	--	1.04	-2.62	.21	14	9	.0	0	5.6	---	23	N	22	8	13	10	5.8	67
DELAWARE																																
Wilmington	73	1010.2	1013.5	89	64	76.2	.3	102	31	55	9	13	0	61	63	1.93	-2.56	.74	8	4	T	T	7.2	NW	--	---	--	14	10	7	4.9	--
DISTRICT OF COLUMBIA																																
Washington CO	72	------	------	90	68	79.1	1.3	104	31	61	17	14	0	--	--	1.66	-2.45	.76	9	7	.0	0	6.0	---	32	SW	14	--	--	--	---	--
Wash. Nat'l AP	14	1009.8	1014.1	90	68	78.8	1.5	103	31	62	17+	13	0	62	58	1.70	-2.56	.76	9	7	.0	0	8.8	SSW	47	NE	14	15	9	7	4.2	73
FLORIDA																																
Apalachicola CO	13	1014.2	1015.2	88	77	82.2	.9	91	7+	72	5	7	0	--	--	9.36	1.80	1.64	14	13	.0	0	6.8	---	26	E	27	8	14	9	5.4	68
Daytona Beach	31	1015.2	1016.9	90	72	80.8	.0	97	23	67	13	21	0	73	82	3.50	-3.61	.95	11	12	.0	0	8.8	SW	*29	SE	16	4	15	12	6.3	--
Fort Myers	15	1016.3	1016.7	90	72	81.4	-.6	95	4+	70	14+	19	0	74	83	9.19	.47	1.31	23	22	.0	0	5.8	E	*27	SSW	27	1	15	15	7.2	--
Jacksonville CO	18	------	------	92	74	83.2	1.5	97	22+	69	30	25	0	--	--	3.32	-4.57	1.31	8	--	.0	0	----	---	--	---	--	--	--	--	---	--
Jacksonville	24	1015.2	1016.3	94	74	83.8	1.7	99	7+	66	30	28	0	71	71	5.71	-1.93	2.51	7	7	.0	0	8.9	WSW	37	E	26	7	14	10	5.7	63
Key West CO	9	1014.9	1015.6	91	78	84.3	.6	93	24+	74	14	29	0	75	75	1.43	-2.81	.44	13	14	.0	0	5.7	E	19	NE	14	4	20	7	7.1	72
Lakeland CO	214	------	------	89	73	80.8	-.4	96	20	70	27+	16	0	--	--	5.70	-2.46	1.07	17	20	.0	0	5.3	---	--	---	--	0	18	13	7.3	46
Miami CO	8	------	------	87	76	81.2	-.4	91	23	68	15	1	0	--	--	5.24	.88	2.30	17	17	.0	0	8.8	S	48	S	15	9	12	10	6.0	68
Miami	8	1015.6	1016.4	90	76	82.9	.3	94	6	71	15	18	0	73	76	9.21	2.48	3.14	16	17	.0	0	7.1	SE	*25	SE	15	3	13	15	6.7	--
Miami Beach	9	------	------	87	78	82.7	.2	93	23	72	15	4	0	--	--	4.56	.73	2.11	15	--	---	--	----	---	--	---	--	7	9	15	---	--
Orlando	106	1012.5	1016.8	91	72	81.4	-.7	96	20	68	1	22	0	73	81	13.64	5.94	3.01	19	16	.0	0	8.0	SSW	*45	ESE	1	4	12	15	6.8	--
Pensacola CO	13	1012.5	------	90	76	82.9	1.9	96	23+	70	9	18	0	--	--	8.42	.83	1.98	13	8	.0	0	----	---	28	SE	27	--	--	--	---	65
Pensacola CAA AP	118	------	1015.6	---	--	----	---	---	--	--	--	--	-	74	78	-----	----	----	--	--	---	--	7.6	SW	--	---	--	--	--	--	---	--
Tallahassee	64	1014.9	1015.8	92	73	82.7	1.7	98	24+	70	31+	25	0	73	78	5.97	-1.90	2.62	12	15	.0	0	4.0	SE	--	---	--	3	18	10	6.5	--
Tampa	19	1015.2	1016.7	88	73	80.7	-1.0	93	2	70	30+	10	0	74	83	6.73	-1.38	1.01	24	21	.0	0	6.0	E	*22	SE	31+	3	11	17	7.0	65
West Palm Beach	15	1015.6	1016.4	90	74	82.1	.1	95	23	69	7	19	0	74	81	11.78	5.08	2.66	20	21	.0	0	7.8	ESE	*35	NNW	22	5	10	16	6.9	--
GEORGIA																																
Albany	190	1008.5	1015.6	96	73	84.5	2.0	100	21+	70	30+	29	0	70	67	5.65	.21	3.76	10	11	T	0	3.8	SW	--	---	--	5	15	11	6.6	--
Atlanta	977	976.0	1016.2	93	72	82.1	2.6	100	7	69	29+	23	0	68	68	6.31	1.90	2.77	10	14	T	0	7.6	W	56	SE	2	7	19	5	5.3	74
Athens	798	987.8	------	94	70	81.8	1.0	102	7	64	7	25	0	--	--	3.95	-.86	1.85	7	14	T	T	----	---	--	---	--	12	15	4	4.4	--
Augusta	143	1008.5	1015.0	94	70	82.4	.9	103	7	63	13	26	0	70	70	4.85	-.36	2.81	4	11	T	T	6.0	SE	*36	E	8	10	10	11	5.5	--
Columbus	385	1002.0	1015.9	93	71	82.0	1.1	99	1	67	28+	25	0	72	--	6.14	.22	1.66	13	17	.0	0	----	---	--	---	--	9	11	11	5.9	--
Macon	356	1001.7	1014.9	96	72	84.0	1.6	103	7+	67	4	28	0	68	65	3.06	-2.28	1.15	7	16	.0	0	8.1	SW	59	SW	4	9	11	11	5.9	71
Rome	637	992.9	1015.6	95	70	82.5	2.5	104	14	61	7	29	0	--	--	2.20	-2.51	1.14	7	17	.0	0	----	---	--	---	--	8	16	7	4.9	--
Savannah	48	1013.2	1015.5	93	72	82.4	1.0	99	4	64	12	25	0	70	71	3.73	-3.36	1.53	8	9	.0	0	8.9	SW	36	W	21	11	11	9	5.4	80
Valdosta	200	1008.1	1015.8	97	72	84.0	2.7	102	14	66	30+	27	0	--	--	6.79	.55	1.82	13	12	.0	0	7.7	SW	--	---	--	5	20	6	5.4	--
IDAHO																																
Boise	2842	917.7	1011.5	92	59	75.4	.6	100	4	44	22	24	0	45	35	.06	-.12	.06	1	1	.0	0	8.8	NW	40	S	16	24	4	3	2.5	91
Idaho Falls 46W CO	4933	848.6	1012.9	89	51	69.9	---	99	12+	33	23	19	0	--	--	.16	----	.10	3	1	.0	0	9.4	WSW	a32	WSW	21	--	--	--	---	--
Idaho Falls 43NW CO	4780	------	------	90	51	70.1	---	100	12+	34	22	18	0	--	--	.53	----	.26	5	0	.0	--	8.0	SW	a38	SSW	21	--	--	--	---	--
Lewiston	1413	962.8	1013.5	88	56	71.6	-3.6	99	6	45	22	14	0	--	--	.37	-.05	.15	6	3	.0	0	----	---	--	---	--	21	5	5	2.7	--
Pocatello	4444	863.2	1012.3	91	56	73.5	.8	99	12+	41	22+	21	0	41	35	.08	-.68	.05	4	7	.0	0	10.5	W	42	S	13	16	10	5	3.9	73
ILLINOIS																																
Cairo CO	314	1001.4	------	96	74	84.9	3.7	104	14	66	9+	27	0	--	--	3.26	.66	2.44	5	7	.0	0	7.5	---	24	W	7	10	17	4	4.3	85
Chicago	610	992.6	1014.9	87	66	76.5	1.9	98	20	55	8	11	0	61	63	4.58	1.85	2.08	8	7	.0	0	7.3	S	36	NE	6	12	11	8	5.0	71
Moline	589	992.9	1015.0	87	65	76.2	.7	98	12	52	8	11	0	65	69	1.98	-1.24	1.45	7	8	.0	0	6.3	E	36	W	[illegible]	10	11	10	5.4	70
Peoria	654	992.6	1014.7	89	67	77.8	2.1	100	18	53	8	14	0	64	62	3.82	.12	1.60	6	6	.0	0	8.6	---	47	W	[illegible]	11	10	10	5.1	78
Springfield	587	991.5	1014.4	93	68	80.4	4.1	112	14	53	8	17	0	63	60	2.25	-.86	.76	7	9	.0	0	9.8	NE	47	NW	3	12	10	9	4.8	81
INDIANA																																
Evansville	383	1000.0	1015.4	94	69	81.1	2.9	105	14	58	10	23	0	64	59	2.14	-.86	1.09	8	9	T	T	7.4	SW	34	NW	31	12	11	8	4.7	80

See footnotes at end of table.

CLIMATOLOGICAL DATA

Table 2—Continued

JULY 1954

State and station	Elevation (ground)	Pressure: Station	Pressure: Sea level	Temperature: Average maximum	Temperature: Average minimum	Temperature: Average	Temperature: Departure from normal	Temperature: Highest	Date	Temperature: Lowest	Date	No. of days: Max. 90° F. or above	No. of days: Min. 32° F. or below	Average dew point	Average relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Greatest in 24 hours	No. of days: .01 inch or more	No. of days: With thunderstorms	Snow, Sleet, Hail: Total	Snow, Sleet, Hail: Max. depth on ground	Wind: Average hourly speed	Wind: Prevailing direction	Fastest mile: Speed	Fastest mile: Direction	Fastest mile: Date	No. of days (sunrise to sunset): Clear	No. of days (sunrise to sunset): Partly cloudy	No. of days (sunrise to sunset): Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.		--	0–3	4–7	8–10	0–10	%
INDIANA (Cont'd.)																																
Fort Wayne	801	984.4	1015.0	87	61	74.1	0.6	103	14	53	8	10	0	60	64	3.83	.55	1.94	8	7	.0	0	8.3	N	61	NW	20	13	12	6	4.7	74
Indianapolis	793	986.1	1015.4	90	66	77.8	1.8	104	14	56	16	17	0	60	57	2.40	-.63	.83	8	7	.0	0	9.5	NE	34	SW	29	9	17	5	4.7	89
South Bend	768	987.8	1015.5	84	61	72.5	-.9	95	12+	50	8	5	0	61	71	5.82	2.78	2.62	9	7	T	T	8.5	NNW	*37	N	6	10	8	13	5.3	--
Terre Haute	578	993.9	1014.8	92	65	78.2	1.3	107	14	50	16	19	0	62	56	2.60	-.04	.96	6	9	.0	0	6.7	NE	--	---	--	12	14	5	4.6	83
IOWA																																
Burlington	694	989.8	1015.1	89	67	78.3	1.5	101	14	55	8	11	0	64	66	2.39	-1.04	.96	7	8	T	T	8.4	E	43	W	3	11	12	8	5.1	79
Des Moines	948	984.1	1014.6	91	68	79.4	3.2	103	11+	61	8	22	0	64	64	1.01	-1.93	.40	6	3	.0	0	10.5	S	32	N	30	7	18	6	5.6	69
Dubuque	1065	977.0	1013.6	83	63	73.0	-.3	94	12	53	8	5	0	64	70	2.66	-.75	1.05	8	7	.0	0	----	---	--	---	--	5	12	14	6.5	--
Sioux City	1094	972.9	1013.1	91	67	79.0	2.7	105	11	58	24	20	0	63	63	1.37	-1.55	.46	7	7	.0	0	9.2	S	54	NW	29	8	15	8	5.1	76
KANSAS																																
Concordia CO	1375	963.4	------	98	73	85.4	5.4	111	11+	65	8+	27	0	--	48	.93	-2.46	.54	6	10	.0	0	7.7	---	31	NW	6	18	8	5	3.6	79
Dodge City	2594	925.8	1010.8	98	72	84.8	4.9	107	11	62	23	29	0	57	44	2.19	-.46	1.01	8	9	T	T	13.9	S	49	NE	27	16	11	4	3.8	83
Goodland	3645	888.3	1011.7	96	66	80.8	5.2	108	11	57	22+	28	0	55	47	1.00	-1.80	.88	4	7	.0	0	9.8	SSE	*24	S	1	18	8	5	4.2	--
Topeka	879	978.0	1012.8	99	72	85.3	6.1	109	12	62	9	27	0	66	57	5.21	1.96	2.25	10	8	.0	0	9.4	E	36	SE	2	16	6	9	4.6	73
Wichita	1321	930.6	1011.7	103	76	89.3	8.4	113	14	68	27	31	0	60	42	.19	-3.24	.17	2	5	.0	0	11.9	S	34	N	22	14	12	5	4.5	92
KENTUCKY																																
Lexington	979	980.0	1015.1	92	67	79.7	4.0	103	14	56	9	19	0	60	56	3.82	-.43	2.12	7	8	.0	0	10.0	NE	--	---	--	12	15	4	4.0	--
Louisville CO	457	------	------	93	71	82.1	3.5	104	14	60	9	21	0	--	--	.77	-2.30	.40	8	1	.0	0	----	---	--	---	--	--	--	--	---	--
Louisville	474	998.3	1014.1	95	68	81.4	3.5	105	14	59	10+	28	0	62	54	1.18	-1.90	.44	8	6	T	0	7.9	SW	31	N	18	15	11	5	4.0	83
LOUISIANA																																
Baton Rouge	64	1012.2	1015.2	92	73	82.6	1.5	99	1	70	5	27	0	73	79	6.75	.88	2.83	19	14	.0	0	7.1	W	--	---	--	4	14	13	6.6	--
Lake Charles	12	1013.5	1014.8	93	75	83.9	1.7	99	16	72	2	25	0	73	75	3.65	-3.28	2.29	8	10	.0	0	8.0	SW	*28	SE	1	4	16	11	6.5	--
New Orleans CO	9	1013.5	------	91	76	83.6	.5	96	16	69	9	25	0	--	--	7.81	.72	2.35	15	16	.0	0	5.6	---	23	SW	8+	2	12	17	7.2	57
New Orleans	3	1013.2	1015.3	91	74	82.4	.6	96	16	70	10	23	0	74	81	11.46	5.57	3.01	17	19	.0	0	8.1	SSW	*45	W	8+	3	14	14	6.7	--
Shreveport	252	1005.4	1014.5	99	75	87.0	3.4	106	24	71	7	29	0	73	66	1.01	-2.69	.67	5	3	T	0	9.1	S	--	---	--	11	8	12	5.4	72
MAINE																																
Caribou	624	987.5	1010.4	70	53	61.5	-2.5	81	29+	42	10	0	0	55	82	5.17	1.14	1.03	18	9	T	0	8.8	WSW	*30	WSW	13+	3	8	20	7.9	--
Portland	61	1007.8	1012.0	77	55	65.9	-1.9	86	13+	44	10	0	0	58	79	2.63	-.20	.83	15	7	T	T	6.9	S	34	NW	31	7	15	9	6.0	58
MARYLAND																																
Baltimore CO	14	------	------	89	71	80.2	1.7	102	31	65	6	12	0	--	--	2.18	-1.76	1.00	7	--	---	--	----	---	--	---	--	--	--	--	---	--
Baltimore	146	1009.5	1014.3	89	64	76.6	.3	102	31	57	16	12	0	60	59	1.77	-2.17	1.07	6	8	.0	0	8.1	NW	38	N	14	14	11	6	4.3	81
Frederick	294	------	------	88	62	74.9	-1.8	102	31	54	16	12	0	--	--	2.73	-.92	1.47	11	--	.0	0	----	---	--	---	--	--	--	--	---	--
MASSACHUSETTS																																
Blue Hill Obs.	636	989.8	1012.8	79	60	68.4	-.8	93	14	52	17	0	0	--	74	2.05	-1.66	.67	13	9	.0	0	12.0	SSW	40	W	14	6	15	10	5.7	60
Boston	15	1008.1	1012.5	80	64	72.2	.0	95	31+	59	17	4	0	59	68	2.50	-.68	.86	13	8	T	T	10.6	SSW	33	N	5	9	12	10	5.7	74
Nantucket	43	1012.5	1013.3	74	61	67.0	-.1	80	31+	53	5	0	0	62	85	1.12	-1.71	.47	8	3	.0	0	10.9	SW	33	S	15	9	10	12	6.0	70
Pittsfield	1153	966.8	------	78	54	66.0	-1.6	92	14	41	17	2	0	--	--	3.72	-1.23	1.27	15	9	.0	0	----	---	--	---	--	--	--	--	---	--
MICHIGAN																																
Alpena CO	587	992.9	------	76	57	66.1	-1.3	90	12	45	8	1	0	--	--	2.08	-.37	1.06	6	7	.0	0	8.8	---	28	NW	14	11	14	6	4.5	76
Detroit	619	989.2	1015.3	83	61	71.8	-1.3	97	14	48	8	7	0	57	60	2.01	-.90	..51	8	5	T	T	7.9	N	33	NW	14	9	15	7	4.9	73
Detroit (Willow Run)	722	987.1	1015.0	83	61	72.0	-1.5	98	14	49	8	8	0	57	63	1.62	-.87	.54	8	5	.0	0	8.1	NE	*24	W	14	12	12	7	4.8	--
Escanaba CO	594	992.9	------	75	57	66.1	-.8	91	12	45	8	1	0	--	--	2.29	-.93	1.25	9	2	.0	0	9.1	---	27	N	21	10	10	11	5.5	67
Grand Rapids	681	990.5	1015.3	81	59	70.0	-1.5	90	12+	47	8	2	0	59	69	2.88	.23	1.05	11	7	.0	0	6.3	WNW	29	NW	31	10	11	10	5.3	65
Lansing	859	984.1	1015.8	81	58	69.5	-1.6	91	12+	46	8	3	0	59	69	2.08	-.20	.56	10	6	.0	0	5.9	WNW	35	NW	31	10	14	7	4.8	73
Marquette CO	677	988.5	------	74	57	65.2	-.9	88	9	46	3+	0	0	--	67	1.17	-1.96	.53	7	4	.0	0	6.3	---	21	SW	19	9	9	13	5.7	68
Muskegon	627	992.6	1015.7	79	59	68.9	-1.0	87	14	46	8	0	0	58	66	3.86	1.74	1.53	10	9	.0	0	----	---	--	---	--	13	10	8	4.9	--
Sault Ste. Marie	721	992.9	1015.6	73	50	61.7	-2.2	85	16+	41	7	0	0	54	76	.95	-1.54	.75	5	4	.0	0	8.0	WNW	24	NW	6	14	7	10	4.7	66
MINNESOTA																																
Duluth	1409	974.6	1015.7	76	55	65.5	-.9	88	13+	48	2+	0	0	56	75	2.70	-.94	.88	11	6	.0	0	10.5	E	29	NW	26	7	12	12	5.9	65
Intern'l. Falls	1179	972.6	1015.2	80	53	66.1	.3	91	26	42	8	1	0	55	70	1.88	-1.56	1.11	10	8	.0	0	7.5	---	--	---	--	9	10	12	5.8	--
Minneapolis	830	982.4	1015.1	84	64	74.4	.3	95	19	55	1	6	0	61	66	1.33	-1.34	.34	9	7	.0	0	9.2	SE	35	SE	9	12	8	11	5.5	59
Rochester	1017	978.3	1014.8	84	61	72.5	.7	96	6+	51	24	5	0	61	70	1.36	-2.11	.73	9	7	.0	0	6.6	SE	--	---	--	7	10	14	6.4	--
St. Cloud	1034	977.3	1014.8	81	60	70.2	-.4	92	26	46	1	2	0	61	74	3.13	.08	1.24	9	7	.0	0	4.8	E	--	---	--	12	8	11	5.3	--
MISSISSIPPI																																
Jackson	315	1003.7	1015.3	96	73	84.5	2.4	104	1	68	31	30	0	70	68	2.65	-1.96	.79	14	9	.0	0	6.7	SW	43	NW	9	6	18	7	5.5	69
Meridian	294	1002.4	------	95	72	83.3	2.4	100	24+	67	6	30	0	--	--	4.63	-1.33	1.98	8	9	.0	0	----	---	--	---	--	12	15	4	4.4	--
Vicksburg CO	234	1006.1	------	94	74	84.2	2.7	101	24	71	31+	28	0	--	--	.94	-3.02	.28	6	7	.0	0	7.9	---	40	SE	16	7	16	8	5.7	69
MISSOURI																																
Columbia	778	987.5	1013.4	99	72	85.4	7.6	113	12+	60	9	27	0	61	48	.33	-2.68	.14	4	3	.0	0	8.9	SSW	27	N	20	13	11	7	4.4	87
Kansas City	741	979.3	1013.1	99	76	87.1	6.2	112	13	66	8	25	0	62	48	.93	-1.90	.35	10	7	.0	0	10.4	NE	31	SE	19	14	10	7	4.4	83
St. Joseph	809	981.7	1013.0	97	73	84.7	4.6	107	13	64	9	26	0	64	52	1.79	-1.30	1.36	6	3	.0	0	8.4	---	35	W	20	18	10	3	4.1	83
St. Louis CO	465	993.9	------	95	75	84.8	4.2	112	14	62	8	25	0	--	--	2.14	-.77	1.02	7	6	.0	0	10.6	---	56	SW	18	14	12	5	4.3	81
St. Louis	552	993.9	1014.2	97	73	84.9	5.2	115	14	62	8	26	0	62	50	2.08	-.50	1.49	6	5	.0	0	8.3	SW	--	---	--	13	12	6	4.5	--
Springfield	1265	967.5	1013.8	98	72	84.8	7.3	113	14	64	26	29	0	64	55	2.45	-.72	.94	7	7	T	0	11.7	S	38	S	22	10	14	7	4.8	86
MONTANA																																
Billings	3568	891.0	1011.5	90	60	75.4	2.1	101	10+	50	2+	18	0	49	43	.23	-.91	.09	5	4	.0	0	10.7	SW	39	NW	21	16	12	3	3.7	79
Glasgow CO	2090	939.4	1012.4	89	59	73.9	1.1	103	5	46	31	19	0	50	47	.21	-1.26	.12	6	9	.0	0	----	---	--	---	--	21	5	5	3.3	--
Great Falls	3664	888.3	1012.5	86	57	71.5	1.9	97	7+	48	22	10	0	43	41	.63	-.72	.49	4	7	T	T	11.9	SW	42	S	16	18	8	5	3.4	84
Havre CO	2488	925.2	1012.5	87	57	72.0	.7	101	20	46	29	16	0	--	--	.54	-.93	.16	7	10	T	T	7.9	---	43	SW	7	19	7	5	3.4	75
Helena	3893	874.0	1012.8	86	55	70.2	2.2	97	4	44	23	11	0	46	48	1.14	.16	.50	8	12	.0	0	7.4	W	51	SW	7	14	10	7	4.3	77
Kalispell	2965	------	------	80	48	63.6	-2.4	91	6+	39	28+	2	0	--	--	2.09	.93	1.19	7	7	T	T	----	---	--	---	--	21	5	5	3.1	--
Miles City	2629	929.6	1012.0	94	62	77.7	2.7	108	5	49	3	24	0	52	--	.82	-.59	.66	4	9	.0	0	9.5	SE	--	---	--	16	14	1	3.5	--
Missoula	3200	902.1	1014.8	84	50	67.2	-1.2	95	6	39	22	10	0	44	50	.79	-.04	.52	4	5	.0	0	6.8	NW	36	NW	20	21	5	5	3.1	79
NEBRASKA																																
Grand Island	1841	948.2	1012.5	95	68	81.2	2.3	109	11	59	23	23	0	61	55	.75	-1.88	.42	4	7	.0	0	11.8	SSE	--	---	--	16	9	6	4.0	--
Lincoln CO	1184	------	------	94	70	82.2	3.0	108	13	62	27	20	0	--	--	3.20	.10	2.00	10	8	.0	0	8.3	---	30	S	10	15	9	7	4.4	80
Norfolk	1544	958.3	1012.9	94	67	80.1	3.9	113	11	52	24	20	0	62	56	.33	-2.70	.28	2	6	.0	0	----	---	--	---	--	13	11	7	4.3	--
North Platte	2779	915.3	1011.4	95	64	79.4	3.6	112	11	54	24	23	0	59	56	1.59	-.81	.82	5	6	T	T	11.8	ESE	35	N	29	15	9	7	4.3	79
Omaha	978	974.3	1013.3	95	71	82.6	4.1	108	13	63	23	22	0	64	57	.72	-2.62	.30	5	3	.0	0	10.6	SSE	44	N	30	14	12	5	4.5	70
Scottsbluff	3950	879.4	1011.5	93	62	77.8	3.2	107	11	49	23	25	0	55	52	2.42	.97	1.18	8	9	.0	0	9.8	ESE	--	---	--	14	14	3	4.0	--
Valentine CO	2581	922.8	------	91	64	77.9	2.6	107	13	48	23	17	0	--	--	1.14	-1.56	1.08	6	7	.0	0	8.5	---	26	S	9	14	12	5	4.2	85
NEVADA																																
Elko	5075	845.9	1013.3	92	50	71.2	1.0	102	13	35	22	23	0	39	34	.24	-.13	.24	1	2	T	T	5.7	SW	*32	S	4	17	10	4	3.3	--
Ely	6257	811.7	1014.2	88	51	69.6	1.2	96	12	38	23	14	0	40	38	.32	-.23	.15	4	6	.0	0	11.3	---	40	S	13	16	10	5	3.8	79
Las Vegas	2162	944.5	1008.0	105	77	90.7	.2	111	29+	69	25	30	0	45	25	1.61	1.15	1.18	3	7	.0	0	10.8	SW	*40	S	12	19	7	5	3.1	81
Reno	4397	863.2	1014.4	91	48	69.4	-.2	99	12	40	1+	22	0	39	38	.08	-.15	.05	3	2	.0	0	6.4	WNW	27	W	7+	23	5	3	2.1	91
Winnemucca	4299	867.9	1012.7	94	52	73.1	-1.1	102	13	37	1	28	0	34	25	.06	-.25	.04	3	2	.0	0	8.8	---	47	W	26	20	7	4	2.8	89

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)				
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
NEW HAMPSHIRE																																
Concord	339	1001.4	1012.2	80	55	67.5	-1.5	91	31	43	17	1	0	57	71	2.14	-1.43	.57	12	9	0.5	0	5.1	NW	27	W	31	6	14	11	5.8	62
Mt. Washington	6262	806.4	1014.9	50	40	45.2	-4.1	58	4	30	16	0	2	--	65	6.58	.22	1.30	23	6	T	0	24.5	W	%86	W	14	1	8	22	8.3	21
NEW JERSEY																																
Atlantic City CO	8	1011.9	1013.2	80	68	73.9	.3	87	14	62	16+	0	0	--	--	1.65	-2.13	1.14	7	5	.0	0	13.5	---	42	NW	14	17	8	6	4.1	81
Newark	11	1011.9	1013.1	87	66	76.2	.9	103	31	59	17	10	0	59	59	1.45	-2.75	.70	9	6	.0	0	10.0	SSW	*38	WNW	14	11	12	8	5.0	--
Trenton CO	56	1006.1	1012.5	86	66	75.9	.6	99	31	59	12+	10	0	--	--	1.70	-2.36	.64	7	6	T	T	8.0	---	*33	NW	14	17	7	7	4.4	74
NEW MEXICO																																
Albuquerque	5310	850.0	1010.5	95	68	81.3	2.3	100	30	61	22+	29	0	50	39	1.45	.02	.55	8	14	.0	0	9.9	SE	45	SE	21	10	19	2	4.4	81
Clayton	4969	848.0	1013.1	91	63	77.2	3.1	97	11	57	1	23	0	--	--	1.77	-.79	1.27	6	9	.0	0	----	---	--	---	--	15	10	6	3.9	--
Roswell	3612	893.7	1011.5	98	67	82.7	3.7	107	27	57	1	31	0	51	38	.33	-1.48	.18	6	9	.0	0	8.8	---	38	SE	28	17	14	0	2.9	--
NEW YORK																																
Albany	277	1008.8	1012.4	82	59	70.4	-1.0	95	31+	45	17	5	0	58	68	1.57	-1.73	.29	13	11	.0	0	6.2	WNW	34	W	31	5	17	9	6.0	56
Binghamton	1601	955.6	1013.9	78	57	67.6	-1.5	94	31	49	10+	3	0	55	68	2.13	-1.69	.95	7	6	T	T	9.0	WNW	38	SW	31	5	18	8	6.0	67
Buffalo	693	986.8	1014.6	80	60	69.6	-1.0	85	28+	51	8	0	0	56	64	2.08	-.35	.84	11	6	T	T	12.0	SSW	38	SW	14	7	15	9	5.5	76
New York CO	10	1001.7	------	84	67	75.3	.7	96	31	60	6	5	0	--	--	.71	-3.53	.28	6	7	.0	0	10.4	---	73	NW	14	14	10	7	4.9	72
New York	19	1011.5	1013.4	86	68	76.8	.9	99	14	62	9+	9	0	61	62	.69	-3.43	.25	4	4	.0	0	7.7	SSW	59	NW	14	11	13	7	4.9	--
Rochester	543	994.9	1013.7	81	59	69.9	-1.3	92	14	50	9	3	0	56	63	1.41	-1.68	.50	7	4	T	0	8.6	SW	42	W	14	11	13	7	5.1	74
Schenectady	217	------	------	82	61	71.3	-1.4	98	30	50	17	3	0	--	--	1.87	-1.70	.35	13	--	.0	0	----	---	--	---	--	15	12	4	3.6	--
Syracuse	424	992.6	1014.0	82	60	70.9	-1.6	93	31+	51	17+	3	0	57	63	1.12	-2.14	.53	7	2	T	T	8.0	NW	34	W	14	10	14	7	5.4	76
NORTH CAROLINA																																
Asheville CO	2203	------	------	88	65	76.3	2.5	96	1	58	7	11	0	--	--	3.10	-1.40	.78	11	14	.0	0	5.8	---	24	NW	7	6	20	5	5.3	74
Asheville	2093	944.1	1015.9	--	--	----	---	---	--	--	--	--	--	65	78	----	----	----	--	--	---	--	2.7	NNW	--	---	--	--	--	--	---	--
Charlotte	753	988.2	1015.3	92	69	80.4	1.8	102	14	62	12	20	0	65	65	4.11	-.56	2.16	11	13	.0	0	5.6	NE	37	SW	15	10	8	13	5.5	74
Greensboro	891	984.8	1015.9	91	66	78.3	1.1	102	14	59	13	14	0	65	68	3.45	-1.49	.87	10	9	.0	0	7.3	SW	31	NW	7	12	11	8	5.2	73
Hatteras	4	1014.6	1015.0	83	73	78.1	-.4	89	20	61	16	0	0	72	81	10.27	3.79	3.57	10	9	.0	0	11.9	SSW	39	SW	6	12	9	10	5.5	60
Raleigh	438	999.3	1015.0	91	66	78.8	.3	101	14+	57	12	15	0	65	69	5.14	-.52	3.05	7	9	T	0	7.5	SW	--	---	--	13	13	5	4.6	84
Wilmington	30	1013.9	1015.3	90	71	80.5	.5	97	3	65	13	18	0	--	--	4.18	-3.98	1.82	9	11	.0	0	9.0	---	32	SW	15	13	9	9	5.0	65
Winston-Salem	967	981.7	1015.8	91	67	78.9	1.4	102	14	60	11	17	0	63	64	3.66	-.91	1.13	9	11	.0	0	7.5	NE	*35	NNW	18	14	9	8	4.9	--
NORTH DAKOTA																																
Bismarck	1650	954.3	1013.5	85	60	72.5	.4	98	18	48	1+	12	0	59	67	3.95	1.62	1.78	9	11	T	T	10.2	E	56	NW	28	12	12	7	5.0	71
Devils Lake CO	1471	961.7	------	80	59	69.5	.2	93	18	42	1	5	0	--	--	.97	-1.70	.18	10	7	.0	0	7.1	---	26	NE	6	13	10	8	4.5	70
Fargo	895	980.4	1014.4	84	60	71.8	.5	99	26	43	1	5	0	60	69	2.34	.03	1.02	8	8	.0	0	11.0	SSE	49	SW	26	8	12	11	5.9	64
Williston CO	1877	946.5	1013.1	84	59	71.6	.7	93	5+	43	1	10	0	54	55	1.86	-.27	.81	10	10	T	T	7.6	---	28	SE	8	14	11	6	4.6	78
OHIO																																
Akron	1210	978.0	1015.8	85	58	71.4	-1.0	100	14	47	8	9	0	56	63	1.62	-2.58	.53	8	4	.0	0	8.1	N	--	---	--	14	8	9	4.7	--
Cincinnati Obs.	761	------	------	90	66	77.9	1.3	104	14	55	9	16	0	--	--	2.30	-1.40	1.00	7	8	T	0	5.0	---	20	W	5	--	--	--	---	82
Cincinnati	869	983.7	1015.3	90	65	77.5	2.4	103	14	55	9	16	0	59	56	3.79	.04	2.10	8	8	.0	0	7.8	ENE	27	N	3	12	12	7	4.8	--
Cleveland CO	663	------	------	80	64	72.0	-1.7	97	14	54	9	2	0	--	--	1.22	-2.13	.80	5	--	.0	0	----	---	--	---	--	--	--	--	---	--
Cleveland	787	987.8	1015.2	86	60	73.1	-.6	99	14	50	16+	9	0	58	61	1.49	-1.55	1.28	4	4	.0	0	8.1	N	34	N	3	14	7	10	4.8	70
Columbus CO	724	------	------	86	66	76.2	.4	101	14	55	8	10	0	--	--	4.32	.79	1.61	10	--	.0	0	----	---	--	---	--	--	--	--	---	--
Columbus	815	986.1	1015.3	87	61	74.4	.0	104	14	52	9	11	0	61	66	3.26	-.59	1.14	9	7	.0	0	5.6	NNW	49	NW	14	12	14	5	4.4	83
Dayton	1002	979.3	1015.1	88	64	76.3	1.3	102	14	54	16	14	0	60	61	2.44	-.85	.67	9	10	T	T	6.2	N	42	NW	3	10	13	8	4.9	86
Portsmouth CO	715	------	------	88	61	74.4	-.3	103	14	53	17+	13	0	--	--	6.68	3.00	2.93	9	11	.0	0	3.4	---	%42	NNW	3	--	--	--	---	--
Sandusky	603	993.6	------	83	65	73.7	-.9	97	14	56	9	6	0	--	--	1.82	-1.63	.59	8	3	.0	0	5.2	---	33	W	20	13	10	8	4.8	74
Toledo	622	992.2	1015.2	83	61	72.1	-1.0	96	14	48	8	8	0	60	67	2.18	-.47	.79	9	6	.0	0	8.2	SSW	26	N	2	12	11	8	4.9	72
Youngstown	1178	973.6	1015.5	83	57	70.3	-2.0	100	14	46	9	7	0	56	63	2.21	-1.95	1.07	4	3	.0	0	7.7	N	*31	N	14	11	11	9	5.1	--
OKLAHOMA																																
Oklahoma City	1280	970.5	1013.1	101	74	87.4	5.3	107	12+	69	5	31	0	63	49	.79	-1.36	.57	3	3	.0	0	10.7	SSE	40	SE	19	22	8	1	2.9	88
Tulsa	672	988.8	1012.6	103	78	90.2	8.1	112	14	71	1	31	0	65	46	.03	-2.66	.03	1	3	.0	0	10.5	S	37	SW	7	18	11	2	3.5	89
OREGON																																
Astoria	12	1018.6	1019.8	65	51	57.7	-3.1	70	22	43	3	0	0	52	82	1.77	1.03	.62	10	0	.0	0	7.2	NW	--	---	--	7	9	15	6.4	--
Burns CO	4140	873.4	1013.6	87	51	68.9	-.9	95	13	38	1	13	0	35	32	T	-.25	T	0	1	.0	0	----	---	--	---	--	21	6	4	2.6	--
Eugene	361	1004.1	1017.7	77	49	62.8	-3.8	85	23+	39	2	0	0	50	66	.19	-.07	.10	3	0	.0	0	7.5	N	*35	W	4	16	6	9	4.2	--
Meacham	4050	------	------	75	48	61.7	-1.5	86	6	37	2	0	0	--	--	.15	-.31	.11	3	0	.0	0	----	---	--	---	--	21	4	6	2.8	--
Medford	1312	967.8	1014.7	89	53	71.1	-.7	98	13	44	2	17	0	48	49	T	-.17	T	0	0	.0	0	4.4	WNW	*21	NW	4	25	2	4	1.8	--
Pendleton	1489	961.7	1014.5	86	56	71.2	-3.3	97	6	45	2	12	0	41	37	.13	-.13	.07	2	1	.0	0	8.5	WNW	---	---	--	21	6	4	2.6	--
Portland	22	1012.2	1017.8	73	54	63.1	-4.2	82	13	45	3	0	0	53	72	1.24	.82	.85	5	0	.0	0	6.3	NW	24	S	10	8	12	11	5.7	58
Roseburg	505	998.6	1017.3	80	49	64.7	---	89	23	40	2+	0	0	--	--	.01	-.19	.01	1	0	.0	0	6.3	---	25	NW	4	17	9	5	3.6	69
Salem	195	1010.2	1017.7	77	48	62.7	-5.0	86	31	43	2+	0	0	50	68	.31	-.01	.22	4	0	.0	0	5.8	NW	--	---	--	15	5	11	4.6	--
Sexton Summit CO	3836	------	------	74	50	61.6	-1.6	84	13	40	1+	0	0	--	--	T	-.32	T	0	0	.0	0	----	---	--	---	--	24	3	4	2.1	--
PENNSYLVANIA																																
Allentown	381	1000.0	1013.9	86	61	73.6	-.5	101	31	52	10	11	0	59	63	1.71	-3.07	.75	7	4	.0	0	7.0	WSW	--	---	--	13	11	7	4.9	--
Harrisburg	335	1000.7	1014.1	87	63	74.9	-.5	101	14	54	17	11	0	58	57	2.33	-1.31	.90	8	5	T	T	5.3	W	47	NW	14	13	10	8	4.8	79
Philadelphia CO	26	------	------	87	69	77.9	.7	99	31	63	6	12	0	--	--	1.50	-2.71	.67	6	3	.0	0	7.1	---	34	N	14	14	8	9	5.1	67
Philadelphia	13	1009.1	1013.4	89	67	77.9	1.6	102	31	59	16	14	0	60	58	1.24	-2.96	.64	6	2	.0	0	7.5	WSW	*47	NNW	14	12	10	9	5.3	--
Pittsburgh CO	749	------	------	86	64	74.8	-.6	99	14	55	16	10	0	--	--	1.57	-2.15	.40	8	--	.0	0	----	---	--	---	--	--	--	--	---	69
Pittsburgh	1151	985.1	1015.3	84	61	72.2	-.1	99	14	49	16	7	0	58	63	2.43	-1.48	.73	6	6	.0	0	8.6	WSW	*35	NNE	14	9	12	10	5.6	77
Reading CO	266	1001.4	1012.9	88	65	76.6	.9	102	31	56	10	14	0	--	--	1.18	-3.25	.45	8	7	.0	0	8.2	---	47	N	14	10	13	8	5.2	66
Scranton CO	746	984.8	1013.5	82	60	71.2	-1.4	96	31	50	17	7	0	--	--	1.75	-2.68	1.01	7	5	.0	0	5.8	---	27	NW	14	12	11	8	4.8	72
Williamsport	527	995.3	1013.9	85	59	72.0	-1.3	99	31+	52	17+	11	0	58	67	2.78	-.93	1.08	9	6	.0	0	5.9	NW	*55	WNW	14	8	15	8	5.4	--
RHODE ISLAND																																
Block Island	110	1008.5	1012.6	75	62	68.4	-.7	81	31+	54	5	0	0	--	--	3.73	1.18	1.25	11	7	.0	0	----	---	--	---	--	8	11	12	5.9	--
Providence	55	1006.8	1012.8	80	60	70.3	-.7	94	14	49	17	2	0	60	73	2.56	-.50	.88	14	10	.0	0	9.8	SW	*27	WSW	14	8	12	11	5.8	53
SOUTH CAROLINA																																
Charleston CO	9	------	------	89	76	82.7	1.2	97	21	67	12	13	0	--	--	5.23	-2.81	2.76	5	7	.0	0	10.1	---	38	N	17	8	10	13	6.0	79
Charleston	41	1013.5	1015.4	91	72	81.2	1.1	99	7	63	29+	18	0	71	76	5.90	-2.14	3.51	6	6	.0	0	9.8	SSW	--	---	--	6	9	16	6.5	--
Columbia	217	1006.4	1014.5	97	71	83.9	2.5	104	7	64	13+	30	0	68	66	2.24	-4.32	1.61	9	14	.0	0	6.6	SW	--	---	--	10	12	9	5.4	81
Florence	146	1009.5	1014.9	96	71	83.4	2.5	104	7	63	13+	28	0	--	--	2.09	-4.36	.96	8	14	.0	0	----	---	--	---	--	10	16	5	5.4	--
Greenville	1018	979.0	1015.0	93	70	81.2	2.8	101	2	65	7	25	0	64	63	2.89	-1.92	1.52	9	12	T	0	8.6	W	42	W	14	8	13	10	5.8	67
Spartanburg	801	------	------	93	71	81.6	2.7	100	14	65	12	25	0	--	--	1.60	-3.10	.51	8	11	.0	0	----	---	--	---	--	11	10	10	5.4	--
SOUTH DAKOTA																																
Huron	1282	966.8	1012.8	90	63	76.5	1.1	104	11	51	31	13	0	61	64	1.10	-.98	.88	5	3	.0	0	9.6	S	32	SW	26	12	12	7	4.7	79
Rapid City	3165	901.1	1012.3	93	62	77.7	5.4	109	12	49	23	19	0	54	48	1.24	-.82	.77	11	13	T	T	11.0	NNW	50	SE	21	14	12	5	4.1	73
Sioux Falls	1420	963.4	1013.6	89	64	76.4	1.6	102	13	54	23+	17	0	61	64	3.74	.74	2.02	8	13	.0	0	8.8	SE	*26	N	29	8	17	6	5.1	--
TENNESSEE																																
Bristol	1519	962.8	------	89	66	77.5	2.7	98	14	59	7	14	0	--	--	5.00	-.14	1.32	10	10	T	0	----	---	--	---	--	11	10	10	5.1	--
Chattanooga	670	988.2	1015.1	96	71	83.4	5.1	103	14	63	7	30	0	69	67	4.09	-1.25	2.33	6	10	.0	0	3.4	SSW	26	W	21	9	15	7	4.9	75
Knoxville	950	979.3	1015.7	94	70	81.8	3.4	101	14	63	7	26	0	66	64	3.34	-1.38	2.05	9	8	T	T	6.5	WSW	56	W	5	12	17	2	4.1	69
Memphis CO	271	------	------	95	76	85.9	4.6	102	1	69	10	29	0	--	--	1.32	-1.78	.46	3	--	.0	0	----	---	--	---	--	--	--	--	---	--

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)				
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F		°F.		#		°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
TENNESSEE (Cont'd.)																																
Memphis	263	1000.0	1014.3	98	75	86.5	5.3	104	18+	68	10	31	0	70	62	.43	-2.80	.17	5	7	.0	0	8.6	SSW	35	NW	24	13	14	4	4.2	90
Nashville	577	995.6	1015.0	96	72	84.1	4.1	105	13	65	17+	30	0	67	60	.71	-3.25	.52	4	10	.0	0	5.8	S	42	N	7	18	10	3	4.0	71
Oak Ridge CO	905	983.1	------	93	67	80.3	2.5	101	14	60	1	24	0	--	--	5.06	-.28	3.48	7	10	T	T	4.5	---	20	NW	3	14	12	5	4.1	--
TEXAS																																
Abilene	1759	952.9	1011.9	100	75	87.4	4.3	107	13+	67	1	31	0	59	40	.08	1.97	.08	1	1	.0	0	11.4	S	34	SE	14	21	7	3	3.1	97
Amarillo	3590	889.9	1011.5	97	69	83.1	5.3	103	25	63	1+	30	0	55	43	.55	-1.81	.33	5	6	.0	0	11.9	S	39	N	22	14	11	6	3.7	87
Austin	615	992.9	1014.0	99	75	86.9	2.8	109	26	71	2+	28	0	68	59	.85	-1.33	.73	4	3	.0	0	9.3	S	29	SW	31	16	9	6	3.9	83
Brownsville	16	1011.5	1014.0	93	76	84.3	.5	101	26	72	3+	27	0	73	74	.18	-1.82	.08	4	3	.0	0	11.8	SE	29	SE	21+	9	13	9	5.4	79
Corpus Christi	40	1013.9	1014.7	95	75	84.8	2.1	101	25	70	12	30	0	73	73	.14	-2.12	.14	1	1	.0	0	12.3	SSE	34	SE	30	10	13	8	5.2	89
Dallas	487	995.6	1013.7	102	79	90.8	5.3	111	25	72	31	30	0	64	45	.53	-1.44	.40	3	3	.0	0	8.7	SSE	33	S	8	19	6	6	3.4	77
Del Rio	1091	979.0	1012.5	98	73	85.4	.7	110	27	66	1	31	0	64	54	.40	-1.18	.17	3	3	.0	0	7.4	ESE	34	NE	27	13	16	2	3.9	84
El Paso	3920	885.9	1010.6	96	71	83.2	1.9	103	27	61	15	28	0	53	38	.88	-.44	.35	10	8	.0	0	10.7	S	56	E	15	13	15	3	4.1	90
Fort Worth	544	993.2	1013.4	102	79	90.5	5.4	109	25	74	31	30	0	63	45	.24	-1.65	.12	4	1	.0	0	13.0	SSW	*42	S	31	19	6	6	3.2	--
Galveston CO	7	------	------	88	79	83.7	.7	93	1	72	17	5	0	--	--	1.05	-3.75	.44	6	--	.0	0	12.1	---	37	S	29	--	--	--	---	82
Galveston	5	1013.2	1015.2	90	79	84.1	.8	95	26	71	17	13	0	76	78	1.33	-3.38	.48	7	6	.0	0	12.4	SW	--	---	--	7	13	11	5.9	--
Houston CO	41	1009.8	------	95	77	85.6	1.8	105	26	73	17	28	0	--	--	7.66	3.21	5.39	7	5	.0	0	8.6	---	31	NE	6	6	15	10	5.8	73
Houston	50	1011.9	1014.3	95	74	84.8	2.2	104	26	70	30	29	0	72	71	4.86	.07	3.07	7	5	.0	0	9.5	SSW	--	---	--	5	14	12	6.3	--
Laredo	500	997.6	1012.4	99	76	87.6	-.1	109	27	71	1	31	0	68	58	.92	-.48	.72	3	2	.0	0	15.5	SE	*39	ENE	29	13	12	6	4.4	--
Lubbock	3243	903.8	1011.8	96	67	81.2	1.9	101	27	57	3	31	0	57	46	.19	-1.70	.13	4	1	.0	0	11.2	S	*30	NE	28	23	8	0	2.3	--
Midland	2854	914.7	1012.3	96	70	83.3	1.3	106	27	62	1	30	0	56	42	T	-1.81	T	0	0	.0	0	5.9	SE	*22	SE	31	23	6	2	2.4	--
Port Arthur	16	1013.5	1014.7	92	75	83.5	1.8	99	1+	71	17	26	0	75	78	2.04	-4.76	1.25	5	8	.0	0	10.2	SW	41	NE	17	5	16	10	6.1	68
San Angelo	1903	947.2	1012.7	97	72	84.5	1.8	105	26	65	1+	30	0	59	45	.17	-1.40	.13	2	1	.0	0	8.7	SSW	*27	SE	14	23	5	3	2.7	--
San Antonio	792	989.2	1013.7	97	75	85.8	1.6	106	26+	69	2	29	0	66	57	1.25	-.66	.74	3	2	.0	0	8.6	S	35	SE	2	13	14	4	4.4	83
Victoria	110	1009.5	1014.0	97	75	86.2	1.4	107	26	70	2	30	0	70	64	.71	-3.42	.35	5	4	.0	0	9.8	---	%52	ENE	6	12	15	4	4.5	--
Waco	500	994.9	1013.1	100	77	88.8	3.8	108	25	73	30	30	0	67	53	.37	-1.57	.30	3	1	.0	0	11.3	S	--	---	--	19	7	5	3.5	--
Wichita Falls	1027	976.3	1011.8	102	77	89.4	5.6	110	25	71	5	31	0	62	44	.21	-1.98	.21	1	2	.0	0	8.7	S	*20	S	2+	20	9	2	2.5	--
UTAH																																
Milford	5028	845.9	1013.4	93	58	75.5	1.5	100	11+	46	23	23	0	--	--	1.01	.24	.58	7	11	.0	0	----	---	--	---	--	17	7	7	3.8	--
Salt Lake City	4222	867.6	1011.8	94	63	78.3	1.7	101	12+	47	22+	24	0	49	41	.91	.30	.48	8	8	.0	0	9.5	SSE	38	SW	20	15	12	4	3.3	86
VERMONT																																
Burlington	331	997.6	1012.1	77	57	67.3	-3.1	87	13	45	10	0	0	57	72	2.18	-1.57	.61	12	6	.0	0	8.2	S	35	NW	31	5	16	10	6.4	67
VIRGINIA																																
Lynchburg	947	982.1	1014.9	88	65	76.5	.5	103	14	59	17+	11	0	--	--	2.32	-1.83	.65	10	9	.0	0	7.1	---	43	NW	15	13	10	8	5.1	78
Norfolk	26	1013.5	1014.9	87	69	78.0	.5	99	3	62	18+	12	0	67	71	4.96	-1.09	1.44	11	9	.0	0	7.9	SW	37	W	15	16	6	9	4.5	73
Richmond	162	1008.8	1014.8	91	66	78.6	1.1	103	14	58	17	18	0	63	63	1.30	-4.34	.73	8	5	.0	0	7.2	S	45	NW	15	15	9	7	4.5	74
Roanoke	1174	974.6	1015.5	91	64	77.5	1.6	104	14	57	12	16	0	62	63	3.27	-1.64	1.55	8	8	T	T	7.2	WSW	--	---	--	10	15	6	4.8	--
WASHINGTON																																
Olympia	190	1010.8	1018.2	72	47	59.5	-3.3	82	6	40	8	0	0	49	72	.82	.10	.58	5	0	.0	0	5.5	SSW	*22	S	10	8	10	13	6.1	--
Seattle CO	14	------	------	70	54	62.3	-3.3	82	6	50	2	0	0	--	--	1.18	.66	1.22	5	0	.0	0	7.6	---	34	SW	10	9	8	14	6.0	54
Seattle	14	1017.7	1018.5	--	--	----	---	--	--	--	--	--	--	50	68	----	----	----	--	--	---	--	6.8	S	--	---	--	--	--	--	---	--
Seattle-Tacoma	379	1004.4	1018.7	70	51	60.1	-3.8	80	6	43	2	0	0	50	75	1.46	.88	.48	6	0	.0	0	9.1	SW	--	---	--	8	9	14	6.1	--
Spokane	2357	946.2	1014.4	81	54	67.5	-2.1	94	6	42	22	3	0	43	45	.85	.49	.55	8	2	.0	0	7.6	SW	22	SE	8	20	6	5	3.3	77
Stampede Pass CO	3958	881.1	1019.2	62	43	52.1	-4.8	76	6	36	1+	0	0	--	--	1.94	.65	.95	7	0	T	T	----	---	--	---	--	13	8	10	4.6	--
Tatoosh CO	101	1015.9	1019.0	58	51	54.3	-1.2	65	6	47	3	0	0	51	90	2.22	.23	1.33	17	0	.0	0	9.1	W	40	E	6	2	6	23	8.2	35
Walla Walla CO	949	978.7	1013.9	87	60	73.5	-2.7	98	6	48	2	12	0	--	--	.13	-.15	.07	3	1	.0	0	5.7	---	18	SW	1	23	3	5	2.4	84
Yakima	1061	975.6	1014.2	84	49	66.6	-4.8	96	14	35	2	9	0	43	46	.03	-.15	.03	2	0	.0	0	8.8	WNW	--	---	--	21	3	7	3.2	--
Walla Walla	1200	------	------	--	--	----	---	--	--	--	--	--	--	45	--	----	----	----	--	--	---	--	7.5	S	--	---	--	--	--	--	---	--
WEST VIRGINIA																																
Charleston	950	980.4	1015.3	88	63	75.0	-.4	102	14	52	17	15	0	64	71	5.11	-.34	3.17	11	9	.0	0	6.3	S	45	N	18	13	8	10	5.3	--
Elkins	1970	948.2	1016.2	82	56	68.7	-1.3	95	14	48	25+	2	0	61	--	6.02	.88	2.90	12	11	.0	0	3.1	NW	47	NW	14	6	12	13	6.1	68
Huntington	565	------	------	91	65	78.1	1.2	105	14	56	17+	19	0	--	--	8.14	3.32	4.23	9	--	T	T	----	---	--	---	--	--	--	--	---	--
Parkersburg CO	615	------	------	87	64	75.4	-.3	102	14	55	16	14	0	--	--	5.69	1.53	1.78	10	10	T	T	4.8	---	36	NW	14	12	14	5	4.5	73
Parkersburg	837	------	1015.0	--	--	----	---	---	--	--	--	--	--	63	--	----	----	----	--	--	---	--	5.0	N	--	---	--	--	--	--	---	--
WISCONSIN																																
Green Bay	689	992.9	1015.6	80	58	68.7	-1.2	91	12	47	8	1	0	59	72	2.94	.35	1.12	6	5	.0	0	6.2	SW	23	SW	19	11	10	10	5.3	64
La Crosse	652	990.5	1014.6	83	64	73.4	-.6	95	19	58	3+	3	0	62	68	2.76	-.45	1.19	10	6	.0	0	7.0	SE	*35	NW	30	7	11	13	6.4	--
Madison	857	980.4	1015.1	85	61	73.1	.1	96	12	55	8	7	0	62	70	5.73	2.43	2.44	7	6	.0	0	7.4	S	38	NW	30	8	11	12	6.3	73
Milwaukee	675	990.9	1015.7	80	62	71.0	-.3	95	12	52	8	1	0	62	75	5.13	2.70	2.50	12	8	.0	0	8.2	NNE	37	SE	6	9	11	11	5.6	68
WYOMING																																
Casper	5322	838.8	1010.4	93	59	76.1	5.0	104	12	47	23	26	0	44	37	.38	-.79	.15	8	11	.0	0	11.6	SW	--	---	--	15	12	4	4.0	--
Cheyenne	6139	815.8	1014.2	86	58	71.9	3.8	97	11	45	23	7	0	48	49	1.20	-.76	.41	11	11	.0	0	10.1	W	33	W	13	10	16	5	4.8	67
Lander	5563	837.1	1012.9	91	58	74.8	4.4	101	11	44	22	22	0	42	35	.90	.02	.42	6	11	.0	0	7.8	---	44	W	29	12	14	5	4.2	85
Sheridan	3942	883.8	1012.1	93	57	75.3	4.7	106	10	45	23	26	0	--	--	.54	-.84	.41	6	8	.0	0	7.7	WNW	49	N	21	15	12	4	3.9	79
PACIFIC AREA																																
Canton Island	9	1009.5	1009.7	88	78	83.1	-1.1	92	11	74	22+	9	0	74	76	2.27	-.06	1.44	8	1	.0	0	----	---	--	---	--	7	15	9	5.7	--
Hilo	31	1014.6	1016.3	82	68	75.0	.2	85	10	64	15+	0	0	68	80	11.28	1.39	1.44	28	0	.0	0	6.2	W	*20	NE	19+	1	14	16	7.1	54
Honolulu	7	1016.3	1016.5	84	73	78.2	-.6	85	6+	70	28	0	0	67	70	1.73	1.39	1.01	13	0	.0	0	12.7	ENE	34	NE	27	7	18	6	5.6	66
Koror CO	94	1005.8	1009.5	87	74	80.7	.2	90	25	70	3	1	0	76	86	15.64	-3.17	3.22	28	8	.0	0	----	---	--	---	--	0	10	21	8.4	--
Lihue	115	1012.2	1017.3	83	72	77.1	-.3	84	3+	68	12+	0	0	69	77	8.85	6.98	5.04	22	0	.0	0	13.8	NE	31	NE	1+	3	13	15	7.4	43
Truk (Moen Island)	8	1009.5	1010.0	85	76	80.6	.3	88	16+	73	21	0	0	76	86	13.65	.19	2.27	24	4	.0	0	----	---	--	---	--	0	7	24	8.7	--
Ponape CO	112	1004.7	1010.1	87	72	79.7	-.7	90	10+	69	12	2	0	75	87	11.37	-5.69	1.66	30	3	.0	0	----	---	--	---	--	0	10	21	8.2	--
Wake Island	11	1012.9	1013.3	85	77	81.0	-1.0	88	11+	72	15	0	0	75	81	5.24	-.18	1.69	21	0	.0	0	12.0	ESE	--	---	--	8	9	14	6.5	--
Yap CO	53	1007.5	1009.3	88	76	82.0	.3	91	8+	72	30	7	0	77	85	7.33	-9.27	2.17	23	3	.0	0	----	---	--	---	--	2	2	27	8.9	--
WEST INDIES																																
San Juan, P.R. CO	47	------	------	85	76	80.6	.6	87	4	72	1	0	0	--	--	3.82	-2.20	1.09	17	4	.0	0	----	---	--	---	--	--	--	--	---	--
San Juan, P.R.	9	1013.9	1016.0	86	76	81.0	.5	90	4	73	28+	1	0	74	80	5.32	-1.06	1.27	19	4	.0	0	12.2	ENE	32	E	14	4	19	8	5.7	83
ALASKA																																
Anchorage	92	1008.1	1013.0	66	50	57.9	.6	76	7	39	3	11	0	48	69	2.08	.53	.50	13	0	.0	0	6.3	SSE	*23	SSE	4	2	7	22	7.9	49
Annette	110	1013.5	1017.6	59	49	53.7	-3.1	70	10	45	20	1	0	49	05	4.07	-1.52	1.04	20	0	.0	0	10.9	SSE	*35	SSE	8	0	5	26	9.0	--
Barrow	22	1009.5	1010.2	46	33	39.3	-.4	66	24	27	22	0	13	37	93	1.55	.72	.86	11	0	T	T	10.4	---	26	W	26	1	7	23	8.2	--
Bethel	21	1011.2	1012.7	62	46	54.2	-.3	75	5+	39	11	5	0	49	83	1.40	-.89	.37	13	0	.0	0	9.9	SSW	*26	SSE	27	0	4	27	9.1	--
Cordova	40	1012.5	1014.1	61	45	52.8	-.5	77	7	34	3	6	0	48	81	7.82	1.38	4.33	16	0	.0	0	5.4	E	*24	ESE	3	0	6	25	9.0	--
Fairbanks	436	993.6	1010.5	69	48	58.2	-2.7	82	16	40	11	16	0	48	70	3.22	1.30	1.51	12	0	.0	0	5.5	WSW	21	SW	10	2	12	17	7.7	--
Juneau	15	1014.6	1015.5	63	46	54.3	-.4	77	27	38	10	3	0	47	79	3.50	-1.15	.97	17	0	.0	0	7.4	N	25	SE	15	2	3	26	8.7	27
Kotzebue	10	1008.5	1009.2	55	44	49.6	-3.0	65	23	37	11+	0	0	45	86	1.68	.15	.69	11	0	.0	0	14.4	W	*35	WNW	10	4	2	25	7.9	--
McGrath	334	999.0	1011.6	65	48	56.6	-2.1	78	8	38	4+	9	0	48	75	4.73	2.41	1.15	13	1	.0	0	5.0	SW	*18	W	10	4	4	23	8.1	--
Nome	13	1009.8	1010.6	53	43	48.0	-1.6	65	17+	33	11	0	0	43	84	4.23	1.77	1.77	11	0	.0	0	10.0	WSW	33	W	7	3	10	18	7.3	41
Northway	1713	948.9	1011.7	66	46	56.3	-2.9	77	15	34	2	13	0	46	70	1.21	-1.68	.55	13	4	.0	0	8.4	NW	*25	NW	9	2	9	20	8.1	--
St. Paul Island	22	1012.5	1013.5	48	41	44.4	-1.5	50	7+	36	12	0	0	43	95	2.67	.24	.46	21	0	.0	0	----	---	--	---	--	0	2	29	9.6	--
Yakutat	28	1014.6	1015.6	58	45	51.9	-.8	72	27	36	5	1	0	49	88	6.46	-2.17	1.11	18	0	.0	0	8.1	SE	*27	SSE	7	3	2	26	8.6	--

Data from airport unless otherwise specified. CO indicates data from city office.
* Data entered in column "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.
+ Other dates also.
% Peak gust.
a Maximum hourly average.
# Maximum 70°F or above for Alaskan stations.

HEATING DEGREE DAYS

(Base 65°F.)

Table 3

JULY 1954

State and station	Current season		Normals
	This month	Period July through this month	July through this month
ALABAMA			
Birmingham	0	0	0
Mobile	0	0	0
Montgomery (CO)	0	0	0
Montgomery	0	0	0
ARIZONA			
Flagstaff	11	11	49
Phoenix (CO)	0	0	0
Phoenix	0	0	0
Prescott	0	0	0
Tucson	0	0	0
Winslow	0	0	0
Yuma	0	0	0
ARKANSAS			
Ft. Smith	0	0	0
Little Rock	0	0	0
Texarkana	0	0	0
CALIFORNIA			
Bakersfield	0	0	0
Bishop	0	0	0
Blue Canyon	9	9	36
Burbank	0	0	0
Eureka (CO)	284	284	267
Fresno	0	0	0
Los Angeles (CO)	0	0	0
Los Angeles	0	0	31
Mt. Shasta (CO)	27	27	37
Oakland	65	65	84
Red Bluff	0	0	0
Sacramento (CO)	0	0	0
Sacramento	0	0	0
Sandberg (CO)	0	0	0
San Diego	0	0	11
San Francisco (CO)	185	185	189
San Francisco	110	110	144
San Jose	4	4	7
Santa Maria	63	63	98
COLORADO			
Alamosa	23	23	64
Colorado Springs	1	1	8
Denver	0	0	5
Grand Junction	0	0	0
Pueblo	0	0	0
CONNECTICUT			
Bridgeport	0	0	0
Hartford	1	1	0
New Haven	6	6	0
DELAWARE			
Wilmington	0	0	0
DIST. OF COLUMBIA			
Washington (CO)	0	0	0
Washington	0	0	0
FLORIDA			
Apalachicola (CO)	0	0	0
Daytona Beach	0	0	0
Fort Myers	0	0	0
Jacksonville (CO)	0	0	0
Jacksonville	0	0	0
Key West (CO)	0	0	0
Miami (CO)	0	0	0
Int. Airport, Hialeah	0	0	0
Miami Beach	0	0	0
Orlando	0	0	0
Pensacola (CO)	0	0	0
Tallahassee	0	0	0
Tampa	0	0	0
West Palm Beach	0	0	0
GEORGIA			
Albany	0	0	0
Athens	0	0	0
Atlanta	0	0	0
Augusta	0	0	0
Columbus	0	0	0
Macon	0	0	0
Rome	0	0	0
Savannah	0	0	0
Valdosta	0	0	0
IDAHO			
Boise	13	13	0
Lewiston	7	7	0
Pocatello	8	8	0
ILLINOIS			
Cairo (CO)	0	0	0
Chicago (CO)	0	0	
Chicago	0	0	0
Chicago University	0	0	
Moline	0	0	0
Peoria	0	0	0
Springfield	0	0	0
INDIANA			
Evansville	0	0	0
Ft. Wayne	0	0	0
Indianapolis (CO)	0	0	0
Indianapolis	0	0	0
South Bend	2	2	5
Terre Haute	0	0	0
IOWA			
Burlington	0	0	0
Des Moines	0	0	5
Dubuque	0	0	8
Keokuk (CO)	0	0	
Sioux City	0	0	8
KANSAS			
Concordia (CO)	0	0	0
Dodge City	0	0	0
Goodland	1	1	0
Topeka (CO)	0	0	0
Topeka	0	0	0
Wichita	0	0	0
KENTUCKY			
Lexington	0	0	0
Louisville (CO)	0	0	0
Louisville	0	0	0
Pikeville (CO)	0	0	
LOUISIANA			
Baton Rouge	0	0	0
Lake Charles	0	0	0
New Orleans (CO)	0	0	0
Int.Airport,Moisant	0	0	0
Shreveport	0	0	0
MAINE			
Caribou	121	121	85
Greenville (CO)	87	87	
Portland	34	34	15
MARYLAND			
Baltimore (CO)	0	0	0
Baltimore	0	0	0
Frederick	0	0	0
MASSACHUSETTS			
Blue Hill Obs.	7	7	
Boston	0	0	0
Nantucket	12	12	22
Pittsfield	41	41	25
MICHIGAN			
Alpena (CO)	47	47	50
Detroit	10	10	0
Detroit (Willow Run)	11	11	
Escanaba (CO)	39	39	62
Grand Rapids (CO)	7	7	0
Grand Rapids	13	13	14
Lansing	17	17	13
Marquette (CO)	76	76	69
Muskegon	18	18	26
S. Ste. Marie	120	120	109
MINNESOTA			
Duluth (CO)	83	83	66
Duluth	56	56	56
International Falls	52	52	70
Minneapolis	1	1	8
Rochester	0	0	24
St. Cloud	20	20	32
MISSISSIPPI			
Jackson	0	0	0
Meridian	0	0	0
Vicksburg (CO)	0	0	0
MISSOURI			
Columbia	0	0	0
Kansas City	0	0	0
St. Joseph	0	0	0
St. Louis (CO)	0	0	0
St. Louis	0	0	0
Springfield	0	0	0
MONTANA			
Billings	3	3	8
Glasgow	20	20	14
Great Falls	18	18	24
Havre (CO)	20	20	20
Helena	14	14	36
Kalispell	93	93	47
Miles City	5	5	6
Missoula	37	37	22
NEBRASKA			
Grand Island	0	0	0
Lincoln (CO)	0	0	0
Norfolk	0	0	0
North Platte	0	0	7
Omaha	0	0	0
Scottsbluff	3	3	0
Valentine (CO)	1	1	11
NEVADA			
Elko	10	10	6
Ely	8	8	22
Las Vegas	0	0	0
Reno	9	9	27
Tonopah	0	0	0
Winnemucca	6	6	0
NEW HAMPSHIRE			
Concord	19	19	11
Mt. Washington	611	611	
NEW JERSEY			
Atlantic City (CO)	0	0	0
Newark	0	0	0
Trenton (CO)	0	0	0
NEW MEXICO			
Albuquerque	0	0	0
Clayton	0	0	0
Roswell	0	0	0
NEW YORK			
Albany	14	14	0
Binghamton	32	32	16
Buffalo	7	7	16
New York (CO)	0	0	0
La Guardia Field	0	0	0
Rochester	9	9	9
Schenectady	2	2	
Syracuse	4	4	0
NORTH CAROLINA			
Asheville (CO)	0	0	0
Asheville	0	0	
Charlotte	0	0	0
Greensboro	0	0	0
Hatteras (CO)	0	0	0
Raleigh	0	0	0
Wilmington	0	0	0
Winston-Salem	0	0	0
NORTH DAKOTA			
Bismarck	23	23	29
Devils Lake (CO)	28	28	47
Fargo	16	16	25
Grand Forks	21	21	
Pembina	22	22	
Williston (CO)	36	36	29
OHIO			
Akron	11	11	0
Cincinnati (CO)	0	0	0
Cincinnati	0	0	0
Cleveland (CO)	2	2	0
Cleveland	3	3	0
Columbus	0	0	0
Dayton	0	0	0
Sandusky (CO)	0	0	0
Toledo	7	7	0
Youngstown	15	15	0
OKLAHOMA			
Oklahoma City	0	0	0
Tulsa	0	0	0
OREGON			
Astoria	219	219	
Burns (CO)	33	33	10
Eugene	74	74	33
Meacham	128	128	88
Medford	2	2	0
Pendleton	11	11	0
Portland (CO)	44	44	13
Portland	63	63	25
Roseburg	40	40	
Salem	74	74	21
Sexton Summit (CO)	119	119	88
PENNSYLVANIA			
Allentown	0	0	0
Harrisburg	0	0	0
Philadelphia (CO)	0	0	0
Philadelphia	0	0	0
Pittsburgh (CO)	0	0	0
Pittsburgh	8	8	0
Reading (CO)	0	0	0
Scranton (CO)	3	3	0
Williamsport	1	1	0
RHODE ISLAND			
Block Island	5	5	6
Providence	6	6	0
SOUTH CAROLINA			
Charleston (CO)	0	0	0
Charleston	0	0	0
Columbia	0	0	0
Florence	0	0	0
Greenville	0	0	0
Spartanburg	0	0	0
SOUTH DAKOTA			
Huron	1	1	10
Pierre	0	0	
Rapid City	1	1	32
Sioux Falls	0	0	16
TENNESSEE			
Bristol	0	0	0
Chattanooga	0	0	0
Knoxville	0	0	0
Memphis	0	0	0
Nashville	0	0	0
TEXAS			
Abilene	0	0	0
Amarillo	0	0	0
Austin	0	0	0
Brownsville	0	0	0
Corpus Christi	0	0	0
TEXAS (Cont'd.)			
Dallas	0	0	0
Del Rio	0	0	0
El Paso	0	0	0
Ft. Worth	0	0	0
Galveston (CO)	0	0	0
Galveston	0	0	0
Houston (CO)	0	0	0
Houston	0	0	0
Laredo	0	0	0
Lubbock	0	0	0
Midland	0	0	
Port Arthur	0	0	0
San Angelo	0	0	0
San Antonio	0	0	0
Victoria	0	0	0
Waco	0	0	0
Wichita Falls	0	0	0
UTAH			
Milford	0	0	0
Salt Lake City (CO)	0	0	0
Salt Lake City	2	2	0
VERMONT			
Burlington	27	27	19
VIRGINIA			
Lynchburg	0	0	0
Norfolk	0	0	0
Richmond	0	0	0
Roanoke	0	0	0
WASHINGTON			
Ellensburg	57	57	13
Olympia	165	165	91
Seattle (CO)	87	87	49
Seattle	147	147	75
Spokane	46	46	17
Stampede Pass (CO)	393	393	251
Tatoosh Island (CO)	324	324	295
Walla Walla (CO)	5	5	0
Yakima	43	43	0
WEST VIRGINIA			
Charleston	0	0	0
Elkins	12	12	9
Huntington (CO)	0	0	0
Parkersburg (CO)	0	0	0
Petersburg (CO)	0	0	0
WISCONSIN			
Green Bay	21	21	32
La Crosse	0	0	11
Madison (CO)	1	1	10
Madison	0	0	13
Milwaukee	9	9	20
WYOMING			
Casper	0	0	13
Cheyenne	11	11	33
Lander	4	4	7
Sheridan	0	0	27
ALASKA			
Anchorage	215	215	239
Annette	345	345	262
Barrow	791	791	784
Bethel	331	331	326
Cordova	369	369	363
Fairbanks	208	208	149
Juneau	326	326	319
Kotzebue	472	472	384
McGrath	251	251	206
Nome	521	521	477
Northway	262	262	186
St. Paul	633	633	592
Yakutat	403	403	381

Data from airport unless otherwise specified.
Co indicates data from city office.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Belgrade (southwest of), Mont.	1	Afternoon	8	*1				$10,000	Hail	Hail pea size to slightly larger.
Harrisburg-Lancaster Area, Pa.	1	1-3:30 p.m.				1			Electrical, wind, hail, and rain	Series of thunderstorms with 30 to 40 m.p.h. winds and gusts to 64 m.p.h. struck this area with locally heavy rain and scattered hail. ½- to 3/4-inch hail reported in Camp Hill area, and varying sizes near Liberty Square and Petersburg, with some crop and fruit damage. In Steelton, winds blew off tin roof and felled trees, with damage to utility lines and parked car. Lightning-set fire destroyed barn and contents near Marietta.
Acadia Parish, La.	1	2-4 p.m.				1		2,000	Wind and electrical	Moved across Parish damaging crops and gardens. Man struck by lightning.
Hardin County, Ky.	1	2:15 p.m.			1				Electrical	Fatality result of being struck by lightning.
Riley (near) Riley County, Kans.	1	About 3 p.m.			0	0	$10,000	0	do	7-room modern country home destroyed 1 mile southwest of Riley; barn burned 2 miles northwest.
Salemsburg, Saline County, Kans.	1	3:08 p.m.			0	0	0	0	Tornado	Funnel cloud observed to touch ground near Salemsburg, but did no damage before pulling back into clouds.
Henderson County, Ky.	1	3:30 p.m.					10,000	90,000	Hail, wind, and electrical	1 barn destroyed by fire caused by lightning. Several tobacco barns damaged by wind. Utility services disrupted. Hail destroyed large quantity of corn and tobacco in fields.
Petersburg, (4 miles west of), Pike County, Ind.	1	Late afternoon			0	0	1,500	500	Tornado	Freak tornado tore through square mile of Gladish Chapel; tore tops from several trees, funneled through some corn, tore roof from building, and disappeared within a few seconds.
Tanacross, Alaska	1	4-4:10 p.m.	1-1/4						Wind, hail, and electrical	Wind from southeast. Lightning and thunder present and hailstones 1 to 2 inches in diameter. 2 airplanes badly damaged.
Philadelphia, Pa.	1	4:30-5:45 p.m.							Electrical and wind	Lightning split power line pole. Winds felled a number of trees, 2 of which fell on parked autos. Falling trees also tore down wires. In Haverford, felled trees damaged 1 house and 3 autos and tore down power lines.
Minnesota, central and southeastern portions	1-2	P.m.-a.m.					60,000	15,000	Rains	Excessively heavy rains that accompanied severe thunderstorms flooded basements, streets, roads, highways, fields, and lowlands. Some brooks and creeks overflowed their banks. Several bridges either washed out or damaged. Damage to hay and growing crops.
Yardley, N. J.	1	P.m.				1			Hail	Hailstones knocked down and dazed 9-year old boy. No damage to property or crops reported. Hail averaged 1 inch in diameter; maximum 1½ inches.
Wedowee (near), Ala.	1	P.m.			1				Electrical	Lightning killed farmer and mule while plowing.
New Ulm (3 miles north of), Austin County, Tex.	1	P.m.							Hail and electrical	Cotton and corn destroyed. 2 barns destroyed by lightning. Damage reported in Henkhaus community.
Wilmer, Dallas County, Tex.	1				1				Electrical	9-year old boy killed by lightning while playing in his back yard.
Fort Worth, Tarrant County, Tex.	1	6 p.m.	4	880			500,000		Wind	About 40 airplanes including two DC3's damaged at Meacham Field, half of them beyond repair. Roofs, signs, and barns damaged. Storm moved northwestward. Brief, but violent.
Middletown, Del.	1	6 p.m.	1	100	0	0	2,000	Minor	Tornado	Funnel observed moved east-northeastward. Demolished 1 building, moved another, and uprooted trees.
Boyle County, Ky.	1	6-6:45 p.m.					6,000	32,000	Hail, wind, and rain	Storm accompanied by high winds and rain toppled 2 barns, damaged tobacco crops, and disrupted utility services.

See footnotes at end of table.

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
	1									Minor storms also reported in Jefferson Davis and St. Landry Parishes, La.
	1									Minor storms also reported in Camilla and Cleveland, Ga.
	1									Minor storm also reported at Live Oak, Fla.
	1									Minor storms also reported in Cass, Crawford, and O'Brien Counties, Iowa.
	1									Minor storms also reported near Malmo, Springfield, and Hartington, Nebr.
	1									Minor storms also reported at Elmo and Inman, Kans.
	1									Minor storms also reported at Baltimore, Conowingo, Blythedale, Middle River, and in Carolina County, Md., and at Fredericksburg, Va.
	1									Minor storm also reported near Dothan, Ala.
Viroqua (near), Wis.	2	4 a.m.					$22,500	$32,500	Rain	Heavy rainfall fell over northeast Vernon County with local flooding of west and east branches of Kickapoo River. 20 basements in small villages flooded. 10 small buildings swept away. 3 homes and 5 other buildings damaged. 75 acres of tobacco, first planting, total loss. 200 acres of corn 50 percent loss. Considerable damage to bridges, bridge approaches, and secondary roads. Unofficial rain of 4½ inches in 1-1/4 hours reported. Storm moved southeastward.
McMinnville (near), Warren County, Tenn.	2	Afternoon			1	1	Slight	Slight	Electrical	Man killed by lightning and his son injured while working in field.
Hickory and vicinity, Catawba County, N. C.	2	2 p.m.				1	1,000		do	Man knocked unconscious by lightning; small fires; telephone lines damaged.
Oconee, Florence, and Darlington Counties, S. C.	2	2-4 p.m.					50,000	100,000	Rain, wind, hail, and electrical	Rain, wind, hail, and lightning damaged crops and buildings.
Fouke (15 miles southeast of), Lafayette County, Ark.	2	4 p.m.	**100	20		1	400		Wind and electrical	In Valley Gin community. Damage by wind $300; by lightning $100.
Fort Oglethorpe (4 miles northeast of), Ga.	2	4 p.m.			3	7			Wind	70-foot oak tree broke off 12 feet above ground and fell on truck carrying work crew of 13 men.
Stone Lake (15 miles northeast of LaGrange), LaGrange County, Ind.	2	5:30 p.m.					15,000		Wind and electrical	6 lake homes damaged by wind and falling trees. About 25 trees uprooted. 1 home seriously damaged when heavy tree fell on it. Home twisted 2 feet off foundation. Power lines cut by falling trees.
Moline, Mich.	2	6:25-6:45	7	*1			°50,000		do	High winds in severe thunderstorms blew over 5 barns, uprooted trees, tore down lines and damaged roofs. 1 house set afire by lightning.
Lower Michigan south-central portion	2	Evening							Electrical	Lightning and fire destroyed 2 barns near Williamston with loss of $6,000. Lightning also resulted in destruction of barn by fire about 3 miles southwest of Freeport.
	2									Minor storms also reported in Hancock, Cobb, and Whitfield Counties, Ga.
	2									Minor storm also reported at Kingsport, Tenn.
	2									Minor storm also reported at Iliff and Proctor, Colo.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
	2									Minor storms also reported in Falmouth and Waquoit vicinities, Mass.
	2									Minor storm also reported in Emmet County, Iowa.
	2									Minor storm also reported near Stanley, Kans.
	2									Minor storms also reported in Shoals Creek, Leighton, Listerhill, and Reynolds Communities, Ala.
Burlington, Iowa	3	5 a.m.	3-4	*1			$250,000		Wind	
Lower Michigan, south-central portion	3	A.m.					62,000		Electrical	4 miles northwest of Homer, lightning struck and killed 7 cows. At about noon, lightning and resulting fire caused $60,000 damage to lumber yard at Williamston.
Fulton, Morrow, and Mobile Counties, Ohio	3	A.m.-p.m.				Few	°10,000		Wind and rain	Violent windstorms and a few thundershowers moved southeastward. Brunt of storm in Noble County.
Missouri, east-central portion	3	Afternoon			2		17,000		Electrical	Farmer and child killed by lightning near DeSoto. House near Farmington struck by lightning, burned with total loss.
Catawba, Davidson, and Yadkin Counties, N. C.	3	3 p.m.				1	10,000	$2,500	Electrical, wind, and hail	Man knocked unconscious by lightning and 2 factories damaged by wind in Hickory. Crops slightly damaged in 3 counties.
Dickson, Dickson County, Tenn.	3	3 p.m.				1	10,000	Slight	Electrical	Man injured by lightning and mule killed. Barn burned along with 1500 bales of hay.
LaSalle, Weld County, Colo.	3	3:30 p.m.				1			do	Lightning severely burned child.
Pendleton, Madison County, Ind.	3	P.m.				2	5,000		do	Barn destroyed by fire, result of lightning strike. Home damaged; 2 occupants slightly shocked and temporarily deafened when lightning burned radio aerial wire.
Hamburg, Franklin County, Ind.	3	Late p.m.					30,000		do	Church destroyed by fire set by lightning.
Hurricane Ridge (near Kewanee), Mo.	3	4 p.m.	3	*2				175,000	Hail and rain	900 acres cotton denuded, some loss to corn and soybeans. Hailstones size of golf balls and heavy rain reported.
Spencer County, Ky.	3	4:25 p.m.				1	1,500	500	Wind and electrical	Storm damaged power and telephone lines, disrupted traffic, toppled trees, and caused damage to crops and other property.
Marion County, Ky.	3	5 p.m.		*1				20,000	Hail	Damaged tobacco, corn, and other crops.
Washington County (south-central portion), Tenn.	3	5-5:01 p.m.				1	6,000	Slight	Wind	Accompanied thunderstorm. 1 barn destroyed, several trees uprooted, several roofs damaged, and glass broken in schoolhouse windows.
St. Petersburg, Fla.	3	6 p.m.							Electrical and wind	Lightning damaged plaster in 1 home and burned wires at several locations. Winds reached destructive force in north and east portions of city. 1 light airplane destroyed, and 3 others damaged. Many trees blown down. Wire lines downed at several points. Coast Guard reported peak wind gust 78 m.p.h.
Illinois, central and northeastern portions	3	6-9 p.m.			1	2			Wind and hail	Widely scattered wind- and hailstorms with centers of activity Morgan through Menard Counties from Jacksonville to Middletown where extensive minor wind damage occurred and 1 building unroofed; Southern Champaign County from Sadorus to Longview where damaging hail occurred over 11-square mile area; and in the Chicago area where 1 man killed and 2 injured, 20-foot stack blown down, and $76,000 cruiser beached.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
	3									Minor storm also reported at Live Oak, Fla.
	3									Minor storms also reported at Bryant Hollow, Smyrna, Swan Pond, and Edwina, Tenn.
	3									Minor storms also reported at St. Peters and Cripple Creek, Colo.
	3									Minor storm also reported at Vida, Mont.
	3									Minor storms also reported in Anderson and Vincennes, Ind.
	3									Minor storms also reported at Federalsburg and Solomons, Md., Bridgeville and Lewes, Del., and Roanoke and Chester, Va.
	3									Minor storm also reported near Ariton, Ala.
	3									Minor storms also reported in Whitfield County and at Ft. Benning, Ga.
Bradenton, Fla.	4	12:30 a.m.			0	0	$500	$0	Tornado (possible)	Removed roof from patio of home.
Lavonia (3 miles east of), Ga.	4			800	0	0		0	Tornado	Large barn destroyed; 2 poultry houses and other farm buildings damaged.
Kinsey, Custer County, Mont.	4	5 p.m.					1,000	10,000	Wind	General damage to buildings on 2 ranches.
Greene County, N. C.	4	5 p.m.						20,000	Hail	Tobacco in fields destroyed.
Jasonville, Clay County, Ind.	4	Midnight				2	1,000		Wind	Wind damaged outbuildings, trees, etc. 2 women injured by debris from previously fire-damaged structure.
	4									Minor storm also reported in Nash County, N. C.
	4									Minor storm also reported in Adel, Ga.
	4									Minor storm also reported in Hancock County, Iowa
	4									Minor storms also reported in Union City and Windsor, Ind.
Clarksburg, Decatur County, Ind.	5	12:30 a.m.					3,000	200	Hail	Greenhouse heavily damaged, autos dented, and some windshields cracked by hailstones varying in size from marbles to baseballs.
Everton and southwest of Connersville, Fayette County, Ind.	5	Early a.m.					4,000	3,000	do	Some fields of corn destroyed. Roofs of some buildings damaged beyond repair. Hailstones size of hens' eggs to golf balls.
Yankton, Clay, Turner, and McCook Counties, S. Dak.	5	1-2 a.m.							Hail and wind	Damage to about 6 areas in 4 counties. Each area not larger than 70 square miles. Crops hardest hit by excessive hail. Clay and Turner Counties most damage. Windows and roofs also damaged. 200 claims submitted.
New Kensington, Pa.	5	8:30-9 a.m.				1	2,000		Electrical	Lightning damaged house and knocked telephone from hands of woman, slightly stunning her.
Claysville, Pa.	5	Morning							do	Lightning struck warehouse, damaging conveyor and part of roof, tearing bricks from wall and starting small fire.
Clearfield County, Pa.	5	9:50 a.m., 10:30-11:30 a.m.			1	6			Electrical, winds, and tornado	Single lightning bolt at golf course killed 1 man, stunned 5 others. An hour later a second thunderstorm with hit-skip "twister-like" winds caused $700 damage to 1 barn, injured a boy, uprooted apple trees; then in another section tore off roof of silo, dumped it into roof of barn; tore off part of another barn roof, tore up tree and dropped it on main highway. Storms active in Glen Richey area, Madera area, and Bigler-Allport area.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Elderton-Purchase Line area, Pa.	5	10:30-11:30 a.m.	15-20	1	0	0			Winds, hail, and tornado	Hit-skip wind- and hailstorm with periodic tornado action moved eastward. At least 2 barns demolished; 4 other barns, 1 house, and other farm buildings damaged by winds. Corn fields stripped of leaves, with only stalks remaining. Grain fields flattened by hail and wind. Garage lifted up and held suspended by wind, while debris carried underneath it, then garage was dropped back almost in place. Scores of trees uprooted or broken. Hail damaged windows in school.
Cogan Station, Pa.	5	Daytime			1	1			Electrical	Boy standing in creek killed by lightning, another injured, but 2 others suffered no effects.
Wynne, Ark.	5	Afternoon					$500	$5,000	Hail	Damage to 2 truck farms. Hailstones size of marbles to golf balls.
New England, all portions	5-6	Afternoon 5th-Evening 6th				2	°250,000		Rain, winds, and electrical	Coastal storm produced heavy rain and high winds; local thunderstorms wrought property and crop damage, severe in aggregate, over widespread areas. Small craft capsized along coasts but no drownings. In Boston area, 2 persons suffered minor injuries from lightning. Property losses by lightning-set fires, by wind damage to trees, power lines, and buildings, and by heavy rain flooding cellars and streets. Crop damage impossible to estimate, but Franklin County, Mass., and central Connecticut tobacco fields hard hit by wind, rain, and hail.
White Post, Clarke County, Va.	5	2-3 p.m.			1	2			Wind	
Baltimore and vicinity, Md.	5	3-6 p.m.				9	1,000,000		Wind and hail	Some hail baseball size.
Unity, Montgomery County, Md.	5	P.m.			1				Electrical	Boy killed by lightning.
Schley County (southeastern section), Ga.	5	Late afternoon	5	*1					Wind, hail, and electrical	Several tenant houses unroofed, barn destroyed, and trees downed by wind. 15 acres of watermelons "ruined" and 30 acres of cotton damaged by hail. 4 cows and 2 calves killed by lightning.
Dawson County, Ga.	5	Late afternoon		*1					Hail and winds	Heavy hail stripped nearly 300 acres of cotton. wind destroyed barn and unroofed other buildings.
Nash, Harnett, Johnston, Richmond, Warren, Scotland, Granville, Person, Graham, Wake, and Durham Counties, N. C.	5	4-8 p.m.					200,000	5,000,000	do	Widespread severe thunderstorms. Crop damage by hail and structural damage by wind.
Bridgeville, Del.	5	5 p.m.							Electrical and wind	Damage of $110,000 included in Delmarva Peninsula storm of 5th.
Delmarva Peninsula, Del.	5	P.m.					500,000		do	
Aliceville (southeast of), Coffey County, Kans.	5	5 p.m.			0	0	5,500	4,500	Tornado, hail, and rain	2 funnel-shaped clouds, 1 touching ground, observed. Building pulled apart and debris including deeply-set hedge posts carried high into air. Hail up to 2 inches in diameter and excessive rain fell, stripping corn and other crops. Property damage from tornado $5,500. Crop damage from tornado $500; from hail $4,000. Moved northeastward.
Anderson, Pickens, and Marlboro Counties, S.C.	5	6-10 p.m.			2	1	20,000	125,000	Electrical, wind, hail, and rain	Power and telephone lines knocked out. Crops and buildings damaged by wind, hail, and rain. Car blown over, 1 hurt. 2 children killed when falling tree crushed home.
	5									Minor storms also reported in Emerson, Montezuma, and LaGrange, Ga.
	5									Minor storm also reported in Bourbon County, Ky.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
	5									Minor storm also reported in Highland and Washington Counties, Ohio.
	5									Minor storm also reported at Belvidere, Tenn.
	5									Minor storms also reported at Greensboro, Clear Spring, Middle River, and in Kent and Queen Anne's County, Md., in Ellendale-Milton area, Del., and at Norfolk and in Halifax County, Va.
	5									Minor storm also reported at Rising Sun, Ind.
	5									Minor storm also reported in Plymouth County, Iowa.
Harding (near), Morrison County, Minn.	6	7 a.m.		440	0	0	$4,000		Tornado (possible)	Large barn badly damaged but house nearby untouched, except a missing windowpane. Farmer lifted about 40 feet in air and dropped to ground unhurt. Silo demolished. Storm moved south-southeastward.
Clark and Kingsbury Counties, S. Dak.	6	Afternoon	20	*2					Hail	Extensive damage reported in 2 counties. Strip from north of Garden City to Vienne hardest hit with excessive hail.
Jefferson County, Wis.	6	2 p.m.	2	200	0	5			Wind, rain, and waterspout	Wind lifted summer cottage off its foundation at Rock Lake near Lake Mills, injuring woman and 2 children. Parts of building found splattered 200 feet away. Woman thrown 100 feet. Children who were taking their nap found together under part of cottage. Next cottage also moved off foundation, hitting adjacent cottage and breaking several windows. Flying glass cut 2 youths. Many boathouses in this lake area also damaged or destroyed. Airplane pilot reported waterspout over Lake Koshkonong.
Walworth County (northeastern half), and Waukesha County, (southern portion), Wis.	6	2 p.m.	50	*45			100,000	$125,000	Wind, hail, and rain	Storm area moved over county during early afternoon; centered over town of Elkhorn from 2 to 2:30 p.m. It blew over trees and buildings, choking main arteries of travel with fallen trees. Hail observed at Elkhorn as well as other areas in county with size from that of cherries to baseballs. Hail 2 inches deep on ground at times. Storm over Elkhorn moved southward. Area in extreme northern Walworth and southern Waukesha Counties had strong winds knocking over trees and telephone lines, also blowing off roofs of many buildings. Trees with circumference of 9 feet uprooted.
Kenosha and Kenosha County, Wis.	6	2:15 p.m.	10	*12	1	3	765,000	300,000	do	Storm moved into Kenosha County from north proceeding south-southeastward with its fury centered over city of Kenosha and community of Bristol. Winds observed as high as 70 m.p.h. at coast guard station at Kenosha. Trees uprooted, electric and telephone lines leveled, buildings destroyed and leveled both in Kenosha proper and throughout county. In Kenosha 2500 telephones out of order with 15 long distance lines out. To electrical power facilities throughout county damage estimated quarter of million dollars. Hail as big as golf balls cut down corn in western end of county. Rainfall of 2.53 inches observed at Kenosha. Many corn and cabbage fields throughout county drowned. According to Red Cross 28 homes damaged, 9 other buildings destroyed and 20 more damaged.
Racine County (southern portion), Wis.	6	3 p.m.	14	*12		1	275,000	100,000	do	Communities of Waterford, Burlington, and Union Grove hit hardest. Hundreds of trees blown over; many parts of highways blocked as trees littered roads. Buildings damaged, with some roofs blown off. Telephone and electric lines by the hundreds knocked down. Water and sewage systems temporarily put out of order in many localities. Hail observed in many localities with average stones 1/8 to 1/2 inch in diameter. Storm moved into Waterford at 3 p.m.; estimated damage $20,000. Union Grove isolated with local president declaring state of emergency. County sheriff's radio car only contact with outside; restrictions issued on use of water. 40 homes damaged; 2 other buildings destroyed and 20 damaged.
Weimar, Colorado County, Tex.	6	3:40 p.m.	½	50	0	0			Tornado	60-foot barn destroyed, porch blown off house, and tree blown down. Moved northeastward.
Garfield, Travis County, Tex.	6	4 p.m.					10,000		Wind and hail	Unroofed 4 or 5 houses and moved church from foundation. Small buildings flattened.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Juneau County (southern half), Wis.	6	4 p.m.					$5,000	$30,000	Wind, hail, and rain	High winds, hail occasionally 1 inch in diameter, and hard rain moved from Mauston area southeastward. Wind reported 70 to 80 m.p.h. Thousands of tons of cut hay caught in fields. Lemonweir River temporarily out of its banks. Storm area moved southward.
Minnesota, south-central and extreme southeastern portions	6	P.m.					5,000	50,000	Hail and rains	Moderate to heavy hail that accompanied severe thunderstorms caused considerable damage to growing crops and some damage to real property. Some hailstones size of walnuts in Sargeant area, Mower County, where path about a mile wide and 7 miles long. Some fields of oats and soybeans total loss, and much damage to corn. Heavy rains of short duration accompanied storm which moved east-northeastward.
Illinois, northern portion	6	4-9 p.m			1	1	1,000,000		Wind and rains	Damage north of line from Clinton, Iowa, to Watseka with severe damage in extreme northeast from Zion to Wisconsin line. Other areas of major damage include Carroll County where 450 telephones out of order; Aurora where streets flooded by heavy rains; Joliet where State Penitentiary suffered $25,000 damages; Kankakee where the fair building unroofed at loss of $20,000; Waukegan where 1 person drowned and another injured; Lake Michigan shore line where seiche greater than that of June occurred but all interests forewarned; scattered damage to farm buildings throughout area.
Dane County, Wis.	6	P.m.	15	800		5	75,000	200,000	Wind and rain	Severe thunderstorms with winds as high as 100 m.p.h., 47 m.p.h. observed at Madison Weather Bureau Office, pushed over eastern Dane County during early afternoon accompanied with heavy rain. At 1 p.m. excessively strong winds passed over Village of Sun Prairie, lasting until 2:30 p.m. Storm moved southeastward. Estimated damage to buildings and property in Sun Prairie area alone $75,000; to crops, baled hay and bagged oats $25,000. Windstorm moved into Cambridge at 1:30 p.m. and lasted until 2:30 p.m., moving south-southeastward. Near Cambridge 2 barns blown over and home damaged. Many trees, telephone and electric lines, and small frame buildings including automobile garages flattened. 4 persons injured slightly at Sandy Beach near Cambridge. Several cars also crushed. Because of hard rain isolated acres of farmland eroded considerably, washing away several inches of good topsoil. Storm considered a straight line windstorm, not tornado.
Michigan City, Porter County, Ind.	6	5 p.m.				1	2,000		Wind and electrical	Trees uprooted, power lines downed, and man knocked unconscious.
Garden City, Kans.	6	5:45 p.m.			1				Electrical	Youth standing in vacant lot killed.
Wells County, N. Dak.	6	Evening	2 or 3	*½	0	0	10,000		Tornado	Struck about 5½ miles southeast of Harvey and moved northeastward in irregular path. On 1 farm, destroyed machine shed, twisted chicken house off its foundation, carried small granary about 100 feet and dropped it on another building. Struck another farm to northeast, destroying large hip-roofed barn and damaged other small buildings. Gasoline storage tank with 250 gallons of gasoline ripped from its foundation and thrown against building. Some crops damaged.
Berrien County, (southern portion), Mich.	6	Evening				1			Electrical, wind, and rains	2- and 3-inch rains, severe lightning, and high winds caused minor damage. Bridge washed out. 1 person injured when tree fell on car. Barn near Buchanan destroyed as result of lightning followed by fire.
Albany, Wis.	6	6:50 p.m.	1	500					Hail and rain	10-minute hailstorm. Hailstones observed as large as hickory nuts. Rain continued on through night, measured at 3.00 inches.
South Bend and vicinity, St. Joseph County, Ind.	6-7	8 p.m.-2 a.m.					50,000		Wind	Trees blown down upon automobiles, houses, and power lines. TV antennas bent.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Illinois, northeastern portion	6	8:30-9 p.m.						$500,000	Hail	Scattered hailstorms, most severe of which covered 60-square mile area between Rockford and Winnebago. Hailstones size of baseballs. Loss to corn alone estimated at $300,000. Some roof and window damage Also heavy damage in eastern Grundy County and western Will County. Near Antioch in Lake County hailstones size of golf balls damaged crops.
Port Angeles, Wash.	6	8:30 p.m.	**200	25	0	0	$2,000	0	Tornado or dust devil	Storm first observed as large cloud of dust whirling down hill. Carport destroyed, greenhouse partially destroyed, several roofs and television antennas damaged. Storm moved out over water and dissipated No wind reported in other sections of city. Storm moved northwestward.
Chalmers (vicinity of), White County, Ind.	6	11 p.m.						200,000	Hail	Hail varied from about 1/2 to 1 inch in diameter. Heavy damage to wheat, corn, and soybeans.
	6									Minor storm also reported at Garwood, Tex.
	6									Minor storms also occurred at Gull Lake and Marshall, Minn.
	6									Minor storms also reported between Belgrade and Cedar Rapids and near Albion, Nebr.
	6									Minor storm also reported near Dodson, Mont.
	6									Minor storms also reported in Winneshiek, Allamakee, Dubuque, Clinton, Kossuth, Hancock, and Cerro Gordo Counties, Iowa.
	6									Minor storms also reported near Montmorenci, La Porte, and Gary, Ind.
Dustin Lake (near Kalamazoo), Mich.	7	1 a.m.				3	10,000		Electrical	Lightning struck home, resulting in explosion and fire. Members of family escaped with only minor injuries.
Fort Myers, Fla.	7	8:45 a.m.			0	0	0	0	Waterspout	Observed from Page Field for 6 minutes. Spout over Caloosahatchie River.
Kentucky, central portion	7	A.m.					28,250	10,000	Wind, electrical, and hail	Damage to houses, barns, trees, utility lines, TV antennas, and 2 screens at drive-in theatres. Also damage to tobacco by hail in Bourbon and Madison Counties.
Calais, Washington County, Maine	7	2-2:05 p.m.	1/4	65	0	0	20,000	300	Tornado	"Baby twister" struck section of Calais during severe thunderstorm, doing heavy damage to trees, utility lines, and several buildings. Funnel cloud observed and debris reported thrown up 200 feet into air. Minor garden damage. Moved eastward.
Cut Bank (6 to 10 miles west of), Mont.	7	3 p.m.	4-5	*½				50,000	Hail	Heavy small-sized hail caused varying damage to 1,800 acres of grain.
Galata, Toole County, Mont.	7	4 p.m.						40,000	do	Heavy hail, some large sized, damaged grains.
Devon, Toole County, Mont.	7	4 p.m.	30	*9			500	100,000	do	Hailstones ½ to 3/4 inches in diameter broke windows and grain stalks.
Havanna (near), Fla.	7	Late afternoon			0	0	7,500		Tornado (possible) and rain	Large tobacco barn destroyed; 3 other barns lost parts of roof, and tobacco in them damaged by rain. Moved southwestward.
Jerseyville, Ill.	7	4:20 p.m.				4	5,000		Wind and hail	Windsquall wrecked display tents at county Fairgrounds. In addition to the 4 injured persons, 10 others received attention for minor cuts and bruises. Severe hail reported south and east of Jerseyville at 4:30 p.m. Minor wind damage also reported southeastward to vicinity of Mt. Vernon.
Kentucky, southwestern and western portions	7	P.m.			1	1	30,200	4,500	Wind, hail, and electrical	Trees uprooted, electric power lines heavily damaged, and plate-glass windows blown out; many homes had damage to roofs; also damage to corn and tobacco by wind and hail. Fatality caused by being struck by lightning.
Mason County, Ky.	7	P.m.					10,000		Wind	Several buildings damaged, utility services knocked out, numerous trees uprooted or broken, and TV aerials snapped or blown over.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Federalsburg, Md.	7	P.m.					$13,000		Electrical	
Clinton (7 miles north of), Parke County, Ind.	7	P.m.			1				do	Fisherman killed when lightning struck fishing rod he was carrying over his shoulder.
Chester, Liberty County, Mont.	7	5 p.m.	10	*10			500	$250,000	Hail	Heavy, large hail damaged 2 granaries and caused severe local crop losses.
	7									Minor storm also reported at Hermann, Mo.
	7									Minor storm also reported at Johnstown, Colo.
	7									Minor storm also reported in Warren County, Ky.
	7									Minor storms also reported in Bridgeville and northern Del., and in Martinsville, Bristol, Flint hill, Charlottesville, and northern Va.
	7									Minor storm also reported at Huntsville, Ind.
	7									Minor storm also reported in Lee County, Iowa.
	7									Minor storm also reported at Butte, Mont.
Davidson County, N. C.	8	4 a.m.					100,000		Electrical	School building burned by lightning fire.
Berkeley, Mo.	8	Afternoon			1				do	Boy killed when struck by lightning at drinking fountain.
West Palm Beach, Fla.	8	1 p.m.			0	0	0	0	Tornado	Pendent funnel under observation by Weather Bureau personnel from 1:00 to 1:14 p.m. and reported by pilot as appearing to reach ground 20 miles west of Del Ray Beach at 1:22 p.m. and dissipating by 1:28 p.m.
Mer Rouge, Morehouse Parish, La.	8	3 p.m.					15,000	Slight	Wind	Destroyed small airplane; damaged roofs and trees.
Homewood, Ala.	8	3:25 p.m.			2	3			Electrical and rain	2 men killed by lightning and 3 others injured when seeking shelter under tree which struck by lightning.
Greenville (2 miles southwest of), Hunt County, Tex.	8	4 p.m.			0	0			Hail and tornado	Window panes broken and trees uprooted. Sheds toppled and barns unroofed. Corn and cotton flattened. Damage in Concord community.
Geyser area to Fergus County line, Judith Basin County, Mont.	8	4-6 p.m.	30-40	*4-8			10,000	950,000	Hail	Hail, heavy and up to 1½ inches in diameter, broke most windows in Geyser. Heavy crop damage on about 75,000 acres of grain land.
Hobart (10 miles northeast of), Kiowa County, Okla.	8	4:50-4:54 p.m.	Narrow	Short	0	0	0	0	Tornado	Small funnel cloud observed in open field, moving east-northeastward.
Between Belt, Monarch, and Stockett, Cascade County, Mont.	8	5 p.m.	30	*10			1,000	1,000,000	Hail	Heavy hail to baseball size caused up to 100 percent damage to crops in places and broke many windows
Coffee Creek to Denton, Fergus County, Mont.	8	5 p.m.	50	*6			1,500	500,000	do	Hail up to 6 ounces per stone and heavier caused severe local damage, total to some fields.
Bladen, Pender, and Person Counties, N. C.	8	5-6 p.m.						55,000	do	Tobacco in fields damaged.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Darlington and Marlboro Counties, S.C.	8	5 p.m.					$50,000	$200,000	Hail and wind	
Haw Creek community (3 miles west of Waldron), Ark.	8	6:30 p.m.	1	100	0	0	4,000	0	Tornado	Funnel cloud observed by several persons. Moved northeastward. 2 barns badly damaged.
Fairview, Richland County, Mont.	8	7 p.m.				1			Electrical	Lightning strike hospitalized person, struck while standing at window.
Baylor, Valley County, Mont.	8	10 p.m.					10,000	25,000	Wind and hail	Scattered damage to grains from spotty, heavy hail. Wind caused general roof damage and blew over a few light buildings.
Vandalia-Nashua-Glasgow triangle, Mont.	8	10 p.m.	30	*1-2			40,000		Wind	General damage to roofs and windows from high, gusty wind.
	8									Minor storm also reported at England, Ark.
	8									Minor storm also reported at Wills Point, Tex.
	8									Minor storms also reported at Bastrop and Shreveport, La.
	8									Minor storms also reported at Ridgley and in Caroline County, Md.
Newton, Newton County, Miss.	9	A.m.			0	0	15,000	0	Tornado	Reported by Red Cross; no other details.
Greenwood, Leflore County, Miss.	9						50,000	5,000	Wind	Glass shattered, buildings unroofed, and trees down and wires cut.
Minnesota, central and southern portions.	9-10	P.m.-a.m.			2		15,000		Electrical	A number of places struck by lightning. Home and barn near Bemidji set afire after being struck by lightning and entirely destroyed. 2 commercial fishermen killed by lightning near Lake City on 10th as they huddled under tree.
Pinewood (vicinity of), Beltrami County, Minn.	9-10	P.m.-a.m.						10,000	Hail	Moderate to heavy hail that accompanied severe thunderstorms caused considerable damage to growing crops. Some hailstones measured 1½ inches in diameter. Some fields of grain damaged up to 50 percent.
Minnesota, North-central portion	9-10	P.m.-a.m.					15,000		Rains	Excessively heavy rains that accompanied severe thunderstorms flooded basements, streets, roads, highways, and farmlands. Culverts and railroad tracks washed out. Some damage to growing crops. Some small rivers and creeks overflowed their banks. At Leech Lake Dam, 7.02 inches of rain occurred.
Opheim (20 miles southeast of), Valley County, Mont.	9	10 p.m.	2	75	0	0	15,000		Tornado	Tornado reliably reported as having tail that whippe up and down to ground causing spotty damage, ripping fences, power poles, crops, and damaging buildings near path. No buildings directly in path. Moved northeastward.
Opheim (12 miles southeast of), Valley County, Mont.	9	10 p.m.	6	*3			7,000	175,000	Hail and wind	Heavy hail caused severe crop damage. Wind damaged elevators, windmills, etc. Wind damage $50,000.
	9									Minor storm also reported at Picayune, Miss.
	9									Minor storm also reported in vicinity of Calabasas, Ariz.
	9									Minor storm also reported near Preston, Kans.
	9									Minor storm also reported in Sampson and Scotland Counties, N. C.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
	9									Minor storm also reported at Metairie, La.
	9									Minor storm also reported at Texarkana, Tex.
Boston Community, Madison County, Fla.	10	Afternoon							Electrical, wind, rain, and hail	1 home destroyed by fire set by lightning. Front porch of another home demolished by falling tree. Storm produced heavy rain and hail.
St. Augustine, Fla.	10	Late afternoon							Electrical	Considerable damage to 1 home and to electric power plant.
	10									Minor storm also reported at Jacksonville, Fla.
	10									Minor storm also reported near McNeal in Sahuarita area, Ariz.
McNeal (6 miles southwest of) and Elfrida (1 mile east of), Ariz.	11	3-3:30 p.m.	3	*1½				$12,750	Hail	Thunderstorm with hail damaged 350 acres of cotton.
Nacogdoches, Nacogdoches County, Tex.	11	5:10 p.m.	1	*1		2			Wind	Took roofs from several buildings, smashed windows, blew down trees, wrecked TV antennas, and downed power lines. 2 youths injured when wind overturned car. Moved southwestward.
Fort Lauderdale, Fla.	11				0	0	0	0	Waterspout	Observed over ocean.
	11									Minor storms also reported in southern and south-central Maine.
	11									Minor storm also reported at Benzonia, Mich.
	11									Minor storm also reported at Montgomery, La.
Coaldale, Fremont County, Colo.	12				1				Electrical	
Mobile and Baldwin Counties, Ala.	12	3 p.m.	12	*6			200,000	500	Wind and hail	Very severe afternoon thundersquall built up over Baldwin County and crossed Mobile Bay with center passing over Mobile. WALA TV tower, 435 feet high, collapsed; 15 automobiles damaged. Brookley Field, on edge of storm, reported gusts up to 75 m.p.h. Hail average size ½ inch, maximum size of hens' eggs. Storm moved west-southwestward.
Globe and vicinity, Ariz.	12	3:30-5 p.m.	18	*5			13,000		Wind	High winds damaged frail hangar at Cutter Airport and power lines, signs, etc. Storm moved westward.
Marana (15 miles south of), and Tucson (south of), Ariz.	12		3-1/4	*3				58,500	Hail and wind	Thundershowers developed in Rincon Mountains, east Santa Cataline Mountain area, then moved westward over Tucson Mountains, then southwestward over South Arva Valley.
Selma, Bexar County, Tex.	12	5:50 p.m.			0	0	Several thousand		Tornado	Unroofed 2 barns and a shed; scattered beehives.
Hammond, Tangipahoa Parish, La.	12	6 p.m.					15,000	Slight	Wind	Destroyed small hangar, damaging 2 light airplanes. Broke windows, uprooted trees, unroofed homes, and severed power and telephone lines.
Palo Verde Valley, Riverside County, Calif.	12	9 p.m.					°200,000		do	A severe windstorm, with wind speeds estimated at 60 to 70 m.p.h. moved in out of southeast from Arizona. 300-x 50-foot hangar and 10 planes wrecked at Heron Field. Considerable damages reported to dwellings in residential area. Power lines and telephone service cut as trees fell on lines or poles went down from force of wind on wires. Alfalfa which had been cut for hay blown away or scattered widely. TV antennas damaged severely.
	12									Minor storm also reported at Covington, La.
	12									Minor storm also reported in Ajo and vicinity, Ariz.
	12									Minor storm also reported at Choteau, Mont.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
	12									Minor storm also reported at Charleston, S. C.
	12									Minor storm also reported near Pensacola, Fla.
Gully (near), Polk County, Minn.	13	4 p.m.			1				Electrical	Farmer killed by lightning.
Alexander County, N. C.	13	5 p.m.						$14,500	Hail	Tobacco and fruit damaged.
Nashville (northwest of), Ark.	13	8:15-8:35 p.m.	6	*3			$5,000	25,000	Hail and wind	Damage by hail, $25,000 to row crops and peaches, and $3,000 to buildings. Wind damage to buildings $2,000. Hail up to 2½ inches in diameter.
	13									Minor storm also reported at Eagle, Colo.
Sheridan, Sheridan County, Wyo.	14	Afternoon			1				Electrical	Death occurred on farm north of Sheridan.
Torrington, Goshen County, Wyo.	14	Afternoon			1				do	
Lansing, Mich.	14	3 p.m.			1				do	1 person killed by lightning while playing golf.
Burke, Cabarrus, Madison, Graham, and Yadkin Counties, N.C.	14	3-6 p.m.						15,000	Hail	General crops and gardens damaged.
Rogers, Ark.	14					2	600		Wind and electrical	Extensive minor damage throughout city. Power service disrupted.
Morgantown, W. Va.	14-15				1				Wind	Miscellaneous wind damage.
New York, scattered sections	14	P.m.				4			Electrical, wind, and hail	A series of local thunderstorms, attending a rapid frontal passage, crossed State from northwest. In In Penn Yan and vicinity losses between $1,500,000 and $2,000,000, with $100,000 atributed to hail damage to crops and $19,000 wind injury to crops. In 15-mile long path, 1 mile wide, most buildings damaged to some degree, trees broken and uprooted, and power and communication lines broken and tangled. A path of like dimensions in Utica area inflicted estimated $500,000 loss, but only $10,000 of total to crops. At Syracuse and vicinity another estimated loss of $200,000 reported, $100,000 of which attributed to hail, $95,000 to crops and $5,000 to other property. Peak wind gusts at Syracuse Airport 42 m.p.h. Weather Bureau in New York City reported speed of 73 m.p.h., but only minor wind damage reported with some disruption of telephone and electric services. Other scattered communities mostly in Ulster, Sullivan, Orange, Otsego, Delaware, Chenango, Chemung, Schoharie, and Montgomery reported appreciable effects of wind, hail, and lightning. Hailstones in various sections generally 1/2 to 3/4 inch in diameter with some as large as 2 inches.
Fairmont, W. Va.	14-15	P.m.-a.m.				1			Wind	Extensive wind damage.
Tucker County, W. Va.	14-15	P.m.-a.m.			2				do	Extensive wind damage. 1 heat death and 1 heart death.
Thomas and Pierce, W. Va.	14	P.m.			0	0	300,000		Tornado	
Kenner, Jefferson Parish, La.	14	P.m.			0	0	0	0	Waterspout	At Jefferson-Orleans Parish line on Lake.
Grangeville and vicinity, Idaho	14	4:15-4:45	7½	*2			15,000	30,000	Wind and hail	Grain and peas about 30 percent broken. Many houses will need repainting in Grangeville.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Monroeville, Allen County, Ind.	14	4:30 p.m.					$5,000		Hail	Average size of hailstones 1 inch in diameter, largest 1½ inches. Many windows broken. Roofs and buildings damaged.
Greenville, and Greenwood, Newberry Counties, S. C.	14	5 p.m.					15,000		Electrical	Several minor fires caused by lightning; autos damaged by falling debris.
Denver, Denver County, Colo.	14	5 p.m.	15	*6			500,000		Rain	Basements flooded; roads undermined.
Pennsylvania, entire State	14-15	5 p.m.-4 a.m.			6	50	°10,000,000		Electrical, winds, rain, and hail	A severe squall line with 30 to 45 m.p.h. winds and gusts to 70 m.p.h. spread southward across whole state between 5 and 9 p.m., with thunderstorm activity continuing for as long as 6 hours after squall line passage. Scores of fires started by lightning, and others by felled power lines. At least 30 barns completely burned. At least 3 persons prostrated by 100° heat prior to squall line passage. Thousands of trees felled by wind and lightning over state, tearing down power and phone lines. Hundreds of television antennas damaged by winds. Several areas reported this the most destructive summer storm in 30 years. Some sections without power for more than 24 hours. Hundreds of homes and businesses had roofs partially or wholly carried off by winds. At least 50 autos damaged or demolished by fallen trees and debris. 4 churches and 6 camp meeting tents suffered major wind damage. Streets and highways blocked for hours in many sections due to fallen trees and wires. Highway bridge in York County buckled by felled tree. Storm damage to wheat and fruit in Erie area estimated at $200,000. Damage to crops elsewhere not estimated. In limited area east and south of Reedsville, loss estimate $2,000,000 for structural damage covered by insurance. Hail in some sections, but relatively little damage. A rockslide near Williamsport on main highway. A number of forest fires put out by these rains.
Blackfoot (7 miles west and north of), Bingham County, Idaho	14	5:45-6:45 p.m.	7	*1				$200,000	Wind and hail	Area affected near Blackfoot on Rising River Land Developing Company. Hailstones, mostly about 1/4 inch in diameter, shelled out grain, stripped most leaves off potatoes, and beat peas level with ground. Damage about 80 percent from hail and 20 percent from wind.
Watkinsville, Oconee County, Ga.	14	Evening							Electrical	Lightning-set fires destroyed high school building and tenant house, and damaged church.
Ackworth, Cobb County, Ga.	14	Evening							do	Residence and barn destroyed by lightning-set fire.
Marietta (8 miles east of), Ga.	14	Evening							do	Residence destroyed by lightning set fire.
Macon, Ga.	14	Evening					20,000		do	Damage by fire in lumber plant, apparently set by lightning.
Hart County, Ga.	14	Evening							Electrical and hail	Severe crop damage by hail. Home destroyed by lightning set fire.
Eastern Detroit, Mich.	14	Evening			0	0			Electrical, hail, and wind	High winds took off roof of house and 2 garages. Minor damage caused by lightning and hail. In Mt. Clemens, lightning struck house which burned to ground.
Idaho Falls and vicinity, Idaho	14	6:10-6:25 p.m.	9	*2½			50,000	250,000	Wind, hail, and rain	One of most severe storms ever to hit Idaho Falls area. Wind and hail damaged telephone lines, signs, buildings, automobiles, and trees in and around city. Damage to crops about 50 percent from hail and 50 percent from wind in area of about 27 square miles of farmland. Heavy rain caused local flooding within city. Wind reached 90 m.p.h. at airport.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Fayette and Clark Counties, Ill.	14	6:45-7:30 p.m.	25	200	0	1	$60,000		Tornado and wind	Storm moved from vicinity of Pittsburg to area 4 miles southeast of Herrick. Extensive damage along route included Country Club at Vandalia, plate glass blown out, 2 buildings unroofed, 3 barns and several smaller buildings destroyed, and trees uprooted. 6 head of cattle killed. Funnel cloud aloft reported from St. Elmo. On same evening severe windsquall demolished drive-in screen, large barn, and several smaller buildings near Casey in Clark County.
Colrain, Franklin County, Mass.	14	6:50-6:55 p.m.	3	33	0	0	2,000	$1,000	Tornado	Spotty damage to trees and utility lines along south-southeastward path, with most damage in Griswoldville, small village in town of Colrain. A few trees twisted, indicating incipient tornadic action.
Hardin County and scattered eastern areas, Ohio	14	Late p.m.			2	10	1,000,000	10,000	Wind	Brunt of storm reported in Kenton, Zanesville, Marietta, Barnesville, Ashtabula, Steubenville, and New Philadelphia.
New Jersey	14	Night							do	Line squalls attaining gale force in thunderstorms struck most sections of State, unroofing buildings, uprooting trees, and breaking electric power and communication lines. Aggregate monetary loss considerable. Moved eastward.
Garrett County, Md.	14-15	11 p.m.-1 a.m.	20	*½	0	Several			Tornado and hail	Hail observed, no damage reported. Storm moved northeastward.
Wheeling and vicinity, W. Va.	14	11 p.m.				6			Wind	Extensive wind damage.
	14									Minor storms also reported at Arcadia, Cambridge, Hagerstown, and in Washington County, Md., Wilmington, Del., and New Martinsville, W. Va.
	14-15									Minor storms also reported in Cumberland and Baltimore and vicinity, Md., Manheim and Ourbin, W. Va., Oover, Oel., and Waynesboro, Va.
	14									Minor storms also reported in Bartow, OeKalb, and Hall Counties also in Atlanta, Ga.
	14									Minor storm also reported at Longmont, Colo.
	14									Minor storm also reported at Valley View, Tex.
	14-15									Minor storm also reported in southern Park County, Mont.
Seminole (2 miles northwest of), Okla.	15	8:20 a.m.	3/4	880	0	0	10,000	0	Tornado	Several garages, concession stand, and trees, twisted and scattered.
Ohio County, Ky.	15				1				Electrical	Fatality result of being struck by lightning.
Sanford, Fla.	15				1				do	14-year old boy killed by lightning.
Bertie, Caswell, Granville, Gaston, Hoke, Rockingham, Cleveland, and Wake Counties, N. C.	15						150,000	350,000	Hail and wind	Considerable structural damage. Crops, mostly tobacco, destroyed in fields.
Oecker, Big Horn County, Mont.	15	Afternoon			1				Electrical	Farmer struck by lightning while riding hay rake during thunderstorm.
Oowney, Bannock County, Idaho	15	3-4:15 p.m.	1	*1			52,000	500	Wind and rain	Some crops covered with silt and stones, but damage occurred principally in village of Oowney where buildings blown in; barns torn down and twisted and some moved as much as 100 feet. Telephone and power lines broken, fences blown down, and many plate-glass windows broken.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Wallowa County, (eastern portion), Ore.	15	6-7 p.m.	3-6	*1-3			$15,000	$10,000	Rain, hail, and wind	Very severe thunderstorm moved northeastward over several square miles. Flash floods accompanying storm washed out or produced slides across county roads at several points; 2 farm homes flooded; machinery damaged; between 50 and 60 acres of hay destroyed by flood waters; straw and other vegetation washed into stream in such quantities as to destroy great numbers of game fish. Slides and washouts marooned several cars. Destruction by hail and wind reported as light, probably less than 5 percent of total.
Greenville and York Counties, S. C.	15	6 p.m.			1		20,000	5,000	Electrical and wind	Man killed and large building destroyed by lightning. Some wind damage.
Deadwood, Lawrence County, S. Dak.	15	7:30 p.m.	**440	20	0	0			Tornado, rain, hail, and electrical	Heavy rain, severe lightning, and some hail in Deadwood area at edge of town in non-populated section. Trees showed evidence of tornado action. Only building in northeastward path had roof destroyed. Power lines cut by flying tree limbs.
	15									Minor storms also reported at St. Ignatius, Christina, and Wyola, Mont.
	15									Minor storm also reported in Christian County, Ky.
	15									Minor storms also reported in Harrisonburg, Lynchburg, Newport News, Staunton, Richmond, Chase City, and Alta Vista and vicinity, Va.
Martin Dam, Ala.	16	12:05 a.m.					15,000		Electrical	Lightning struck large warehouse, and building and contents destroyed by resulting fire.
Carpenter, Laramie County, Wyo.	16	Afternoon	2	*1			500	30,000	Hail	
Athol-Belmont area, Kootenai County, Idaho	16	Afternoon							do	Damage in Athol-Belmont area. Roofs were damaged, windows broken, grain ruined and hay beat down.
Tucson area, Ariz.	16	2:20-2:45 p.m.				1	2,000		Wind	Damage to buildings, trees, communications and power lines. Winds to 57 m.p.h. at W.B.A.S., 75 m.p.h. at tower level. Thunderstorm moved northwestward.
Hazelton (near) Idaho	16	3 to 4:30 p.m.	9	*1				100,000	Hail and rain	About 90 percent loss of peas and grain, 40 percent of potatoes, and 25 percent of hay and clover seed. Storm described as moving south to northeast to southeast in Dixon, Greenwood, and Shoestring areas southeast of Hazelton. Hail to ½ inch in diameter. Damage mostly by hail.
Lincoln County, Idaho	16	4:10-4:40 p.m.				1	1,000		Electrical	Lightning knocked 1 man unconscious (no permanent injuries); killed 4 cows and injured 2. Damage to livestock estimated at $800; other property $200.
Spokane (12 miles north of), eastward to Mt. Spokane, Wash.	16	4:30 p.m.	20	*2			50,000	200,000	Hail	Hailstones 1 to 1½ inches in diameter destroyed all crops, damaged building roofs, and caused power failures. Hail completely covered ground, giving appearance of winter snow cover. Hail drifts to 18 inches deep. Storm moved eastward.
Latah County, Idaho	16	5:20-5:40 p.m.						95,000	do	Principal damage near Potloatch; very little damage at Moscow where hail small and soft. Hailstones reported up to 1½ inch diameter at Potloatch. Most loss due to damage of wheat, barley, and peas; minor damage to roofs and windows.
Louisville, Miss.	16	6:30 p.m.					100,000	5,000	Wind	Buildings unroofed, plate-glass windows broken, trees uprooted, lumber sheds demolished. Moved southward.
Bellview Community (near Selma), Ala.	16	P.m.			1				Electrical	Man killed when bolt of lightning hit tree under which he had taken refuge.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Mobile County, Ala.	16	7 p.m.			1		$5,000		Winds	Line of rather severe thunderstorms moved across Mobile County during late afternoon and early evening. Highest wind speed observed at Bates Field 48 m.p.h. in gusts. Much higher winds must have occurred in other localities. A fleet of fishing boats, ranging from skiffs to Coast Guard Cutters, dispersed at Alabama Deep Sea Rodeo around Dauphin Island.
Bayou Liberty, St. Tammany Parish, La.	16	8 p.m.			0	0		$0	Tornado (possible)	May have been tornado, but little data available.
	16									Minor storms also reported in Canyon, Ada, and Owyhee Counties, Idaho.
	16									Minor storm also reported in Young area, Ariz.
	16									Minor storm also reported at Clearmont, Wyo.
	16									Minor storms also reported at Manhattan and near Lenoxa and Bucyrus, Kans.
	16									Minor storms also reported near Lancaster, Antelope Valley, San Bernardino County, Calif.
	16									Minor storm also reported at Mount Ida, Ark.
Evangeline, Acadia, and St. Landry Parishes, La.	17	Early a.m.					1,000	15,000	Wind	Damaged rice and falling trees severed power and communications lines. Moved southwestward.
Englewood and Littleton, Arapahoe County, Colo.	17	Afternoon	6	*4			50,000		Rain	Flooding of basements, etc.
Greenville, S. C.	17	1 p.m.					35,000		Wind, rain, and electrical	Thunderstorm with high winds and heavy rain did widespread minor damage to buildings, signs, and power and communications lines in city. Some damage from rain and lightning.
From north of Outlook to east of Reserve, Sheridan County, Mont.	17	4-6 p.m.	30	*1			25,000	500,000	Hail	Hail to baseball size caused crop loss of 50 to 100 percent; broke windows, damaged roofs all along route of storm. Plentywood suffered considerable damage to glass in business district.
Guthrie (6 miles east and 2 miles south of), Logan County, Okla.	17	4:55 p.m.	Short	Narrow	0	0	500	0	Whirlwind	Struck farmstead.
Williams and McKenzie Counties, N. Dak.	17	Evening	15	*3			15,000		Hail and wind	Storm apparently struck first at Buford-Trenton irrigation project southwest of Williston, completely hailing out some crops, then moved southeastward to near Arnegard. Large new barn destroyed on farm 9 miles north of Alexander; walls all fell outward. 40 tons of hay in loft fell on 4 cows killing 1 outright and injuring the others. Other damage to buildings occurred in storm path. Hail damage ranged up to 100 percent. 1 farmer, the one whose barn was destroyed, has been hailed out 4 years in a row.
	17									Minor storms also reported in Winnebago and Carroll Counties, Iowa.
	17									Minor storm also reported in Clarksburg, W. Va.
	17									Minor storms also reported at Anniston and near Dotban, Ala.
Bisbee-Douglas area, Ariz.	18	2-4:30 p.m.	5				20,650	3,000	Rain, wind, hail, and electrical	Hail 3/4 to 1½ inches in diameter in St. David area damaged crops and buildings. Wind and flooding damage to property in Douglas-Bisbee area. Hail damage at St. David $3,500. Rain and lightning damage at Bisbee $18,150. Wind damage Douglas area $2,000.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Richwood and vicinity, W. Va.	18-19	P.m.-a.m.			1		$1,700,000	$340,000	Rain	
Pine Bluff, Ark.	18	5-6:30 p.m.					40,000	5,000	Electrical and hail	Crop damage by hail. Property damage by lightning striking several houses.
Holly Springs, Miss.	18	6:02 p.m.			0	0	0	0	Tornado	Tornado seen aloft by observer near town. Moved northeastward.
Tatum, Rusk County, Tex.	18	6:40 p.m.	3/4	880	0	0	35,000	5,000	do	Buildings unroofed; garages, barns, and small buildings destroyed; gymnasium demolished. Damage spotted. Moved northeastward. 2 clouds merged.
Dupont, Ind.	18	Late p.m.			0	1	5,000	0	Wind and electrical	About 99 percent of damage by wind, remainder by lightning. Roofs damaged, windows blown out, TV antennas downed. Injury from flying glass.
Ohio, southern portion	18-19	Late p.m. -early a.m.				Few	°20,000		Electrical	2 large barns and stored crops destroyed by fire at Wilmington and roof of residence at Portsmouth.
Hutchinson, Kans.	18	11:40 p.m.					103,000		do	Store basement, liquor store, and recreation parlor burned, following lightning strike.
	18									Minor storm also reported at Smackover, Ark.
	18									Minor storm also reported in Lynchburg, Va.
	18									Minor storms also reported in Connersville, Milton, and Carlisle, Ind.
	18									Minor storm also reported near Fowler, Kans.
	18									Minor storm also reported in San Bernardino County, Calif.
	18									Minor storms also reported in Linn and Clinton Counties, Iowa.
Van Buren County, Iowa	19	8:30 a.m.				2	100		Electrical	Lightning struck home.
Jefferson County, Ky.	19	A.m.					16,200		Wind	Uprooted trees and disrupted electrical and telephone services; falling trees damaged 4 cars; outdoor theatre damaged.
Kentucky, Central portion	19	A.m.					°48,500		Electrical, wind, and hail	Numerous trees downed; utility lines put of commission; several buildings hit by lightning, either being completely destroyed or damaged. Most crop damage by hail in Jessamine County.
All New England, except northern parts of Maine, New Hampshire, and Vermont	19	Afternoon until near midnight				2	°500,000		Wind, rain, hail, and electrical	Damage from wind, rain, hail, and lightning-set fires, as locally severe thunderstorms struck numerous communities. 2 Chicopee Falls, Mass., men burned by lightning. Utility damage particularly severe (estimated $200,000) in Norwalk, Conn. Crop damage occurred, especially in central Massachusetts and southern Vermont, but no estimate could be made.
Foreman, Ark.	19	2:35 p.m.			1				Electrical	Woman standing near clothesline killed by lightning.
Kingsland, Ark.	19	5:30 p.m.	2	Narrow	0	0	1,000	0	Tornado	Traveled east-northeastward. Tornado funnel did not touch ground at any time, but dipped down enough to damage tops of 2 houses as well as uproot trees.
	19									Minor storms also reported in Washington, Jasper, and Boone Counties, Iowa.
	19									Minor storm also reported at Oshkosh, Nebr.
	19									Minor storms also reported in scattered sections of Maine, New Hampshire, Massachusetts, and Connecticut.
	19									Minor storm also reported in Braxton County, W. Va.
Goshen-Millersburg area, Elkhart County, Ind.	20	3:30 a.m.					12,500		Electrical	Small home and furnishings destroyed by lightning. Large barn destroyed and fire also started in nearby wheat field by lightning.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons: Killed	Number of persons: Injured	Estimated damage: Property (exclusive of crops)	Estimated damage: Crops	Character of storm	Remarks
Manchester, Hillsboro County, N. H.	20	Early morning					$20,000		Electrical	Damage to building from lightning-set fire.
Grand Rapids area, Mich.	20	Late morning					°50,000		Wind and hail	Hail up to golf-bsll size ruined several truck gardens. Winds up to 63 m.p.h. felled trees, pulled down utility lines, and damaged other property.
Washington County, (southwestern portion), Kans.	20	Afternoon							Wind	2 points of spot damage to barns and sheds: (1) 3½ miles northwest of Clifton; (2) 1 mile west of Brandtford.
Ohio, central and southeastern portions	20	Afternoon and evening			4	Few	°1,500,000		Rain, wind, and hail	Torrential rains, high winds (50-70 m.p.h.), and hail. 5.72 inches of rain measured at Hillsboro and 5.35 inches at Wilmington.
Cumberland, Rockingham, Alamance, Rowan, Yadkin, Wilkes, and Robeson Counties, N. C.	20	3-4 p.m.			3		15,000	245,000	Electrical and hail	Lightning killed 3 persons. Crops, mostly tobacco, destroyed in fields.
Duncan area, Ariz.	20	3-4 p.m.	3	880			10,000	3,000	Hail	Hail up to 3/4 inch in diameter damaged cotton aod buildings.
Calabasas-Tubac area, Ariz.	20	3-6 p.m.	20	*3-4				10,000	do	Hail up to hickory nut size.
San Manuel-Mammoth area, Ariz.	20	4:45-6:45 p.m.				2	25,000		Winds, rain, and hail	Flash floods washed out sections of roads aod flood homes and stores in lowlands. Some roof damage by high winds in San Manuel. Hail light.
Tucson area, Ariz.	20	5-8 p.m.				1	1,500		Wind, rain, and electrical	Wind to 50 m.p.h. preceding rain, with lightning an flash flooding. Major damage due to flooding and lightning. Flood damage $1,000; lightning $500.
Tecumseh (5 miles southwest of), Nebr.	20	5 p.m.	1	35	0	0	2,000	Minor	Tornado	Cattle shed destroyed and telephooe lines damaged. moved northeastward.
Columbia City and vicinity, Ind.	20	5 p.m.					20,000		Electrical	Lightning destroyed large barn and its contents.
Darlington, Florence, and Walhalla Counties, S. C.	20	5 p.m.				1	5,000	5,000	Hail, wind, and electrical	Crop damage from hail. Scattered structural damage from wind. Young woman injured by lightning in home.
Garrett County, Md.	20	5-7 p.m.	10	*1					Wind and hail	High winds caused damage as did 1½ inch hail.
Halifax and Pittsylvania Counties, Va.	20							150,000	do	
Iowa, southeastern portion	20	Evening				2	5,000	1,000	Wind and electrical	Damaged farm buildings and crops. Lightning destroyed livestock and burned farm buildings.
Three Oaks, Mich.	20	Evening					10,000		Electrical	Lightning and resulting fires destroyed barn and contents.
Miami, Ariz.	20	6-7:30 p.m.		*7		5	150,000		Rain and wind	Heavy rain resulted in flooding of streets and buildings, that piled up automobiles and loose property.
Joplin (5 to 6 miles south of), Liberty County, Mont.	20	6-7 p.m.	10	*4				100,000	Hail	Heavy medium-sized hail damaged grains.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
New Carlisle, Ind.	20	6:25 p.m.					$20,000		Electrical	Large barn and contents destroyed by lightning.
Illinois, Central portion	20	6:30-7:30 p.m.					50,000		Wind	Windsqualls damaged property at widely scattered places from Peoria-Camden area southeastward. Heaviest loss to drive-in screen which completely demolished at Decatur at 7:30 p.m.
Tippecanoe Lake, Kosciusko County, Ind.	20	P.m.				1			do	Wind blew large limb down on boy, seriously injuring him.
Mentone, Kosciusko County, Ind.	20	P.m.				3	1,500		do	Tree fell on automobile demolishing it and injuring its 3 occupants.
Pierceton (near), Kosciusko County, Ind.	20	P.m.					10,000		Electrical	2 barns destroyed by lightning.
Churubusco and vicinity, Whitney County, Ind.	20	7 p.m.					25,000		Wind	Barn and garage destroyed; 8 automobiles damaged by falling trees, church roof blown off. Elevator and feed mill destroyed or badly damaged.
Albion, Noble County, Ind.	20	7:15 p.m.					10,000		Electrical	Lightning struck school severely, damaging it; also some lightning damage to telephone facilities.
Columbia City and vicinity, Ind.	20					2	15,000		Wind	Buildings and telephone lines severely damaged, trees downed, etc.
Fort Wayne and vicinity, Allen County, Ind.	20	7:30-8 p.m.			1	35	1,000,000		do	Most damage caused by falling trees; damage to TV antennas and roofs of houses and barns. No evidence of tornado. Peak wind gusts at airport 86 m.p.h. Death caused when barn, in which he sought refuge, collapsed. Estimate 10,000 to 15,000 insurance claims in city of Fort Wayne only.
Plainfield and vicinity, Ind.	20	9 p.m.			0	0	12,000	0	Tornado	New barn entirely leveled and scattered, 2 sheep killed, trees uprooted, and chicken house demolished; damage to buildings on 6 farms. Statement that parts of barn were "blown in almost every direction almost half a mile" indicates tornado.
Nashua (10 to 15 miles northeast of), Mont.	20	10 p.m.	5	*1				$15,000	Hail	Light to heavy hail, size not reported.
	20									Minor storms also reported at Cromwell, Clinton, New Haven, Williamsburg, Auburn, Lake Wawasee, and North Salem, and in St. Joseph County, Ind.
	20									Minor storm also reported near Douglas, Ariz.
	20									Minor storms also reported in Mahaska, Appanoose, and Oes Moines Counties, Iowa.
	20									Minor storms also reported at Cumberland, Md., Saltville, Va., and at Huntington and in Wood, Ritchie, and Doddridge Counties, W. Va.
	20									Minor storms also reported near Liberty and Diller, Nebr.
	20									Minor storm also reported at Windsor, Colo.
	20									Minor storm also reported near Hiawatha, Kans.
Rapid City, Pennington County, S. Dak.	21	Afternoon					10,000		Wind and hail	70 m.p.h. winds and 1-inch hail broke windows and damaged roofs, gardens, crops, and power lines. Drive-in theater screen destroyed. Airplanes at airbase damaged slightly.
Washington County, Colo.	21	Afternoon	20	*8			8,000	40,000	Rain and hail	Bridges and fences washed out.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Torrington, Goshen County, Wyo.	21	3:35 p.m.	**15	10	0	0	$1,000	$0	Tornado	Small tornado. Damaged roofs of 2 buildings.
Sidney (20 miles northwest of), Mont.	21	4 p.m.	15	*4				100,000	Hail	Hail to golf-ball size.
Baker Vicinity, Mont.	21	4-6 p.m.					1,000	15,000	Wind and hail	Scattered damage over large area. Wind $15,000 loss; hail $1,000.
Chadron, Nebr.	21	4:30 p.m.	300	50			40,000		Wind	Buildings damaged. Moved northeastward.
Wibaux vicinity, Mont.	21	5-6 p.m.	4	*2			5,000	40,000	Wind and hail	Wind $25,000 loss ($5,000 to property), hail $20,000.
Pulaski County, Ky.	21	P.m.			1				Electrical	Woman killed when struck by lightning while sitting in her living room.
Greene, Duplink, New Hanover, Robeson, Moore, Lee, Harnett, and Richmond Counties, N.C.	21	P.m.					250,000	20,000	Electrical, hail, and wind	Lightning fires destroyed several buildings. Crops damaged by hail and wind. Several beach houses damaged by wind.
	21									Minor storms also reported north of Morrill and Henry, Nebr.
	21									Minor storms also reported in vicinities of Sage and Fordyce, Ark.
	21									Minor storms also reported in Connecticut, Massachusetts, and Rhode Island.
	21									Minor storm also reported at Plymouth, Mich.
	21									Minor storm also reported in Pittsylvania County, Va.
Hillsboro (near), Marion County, Kans.	22	2:45 p.m.			0	0	2,000	0	Tornado	Debris of demolished machine shed scattered in 4 directions. Trees broken off. Moved northwestward.
Pittsburg, Kans.	22	3 p.m.			1	2	5,000		Wind and electrical	Boy electrocuted by line wire blown down into ditch of water. 2 women injured when lightning struck smokestack of building. Plate-glass windows broken; trees blown down.
Brownsville Community (near Tuscaloosa), Ala.	22	P.m.				1			electrical	Girl treated for facial burns and shock when lightning struck her home.
Springfield, Mo.	22	5:25-7:25 p.m.					10,000		Wind and rain	Drought-breaking rain squall. Trees uprooted. Numerous breaks in telephone and power lines. Small building at fairground flattened.
Oswego (6½ miles southwest of), Kans.	22	Evening	10	440	0	0	Not estimated	0	Tornado	New machine shop unroofed, power line poles pulled up, and small buildings lifted on 1 farm. Moved northeastward.
	22									Minor storms also reported near Pratt and Arkansas City, Kans.
	22									Minor storm also reported at Farmington, N. Mex.
	22									Minor storm also reported in Raky Run, Va.
	22									Minor storms also reported in southern Essex County, Mass.
	22									Minor storms also reported in vicinities of Desha, Berryville, and Clarksville, Ark.
	22									Minor storm also reported near Stratton, Nebr.
	22									Minor storm also reported at Esterbrook, Wyo.
	22									Minor storm also reported at Forder, Colo.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Massachusetts, eastern portion	23	Afternoon				2	Slight		Electrical and rain	2 Boston men injured by lightning bolts. Middleboro cranberry bogs damaged.
Wagoner County (extreme southern portion), Okla.	23	1 p.m.	Short	Narrow	0	0	$1,000	$0	Whirlwind	Damage to 1 farm; moved in easterly direction.
Tucson-Continental-Sahuarita area, Ariz.	23	3 p.m.					20,000	136,000	Rain	Localized heavy thundershowers brought 2 to 3 inches of rain coursing down canyons into Santa Cruz River bottoms. Flood damage to railroad. Crop damage and property damage occurred in radius of 30 miles from Tucson.
Centrahoma, (½ mile southeast of), Okla.	23	4:45 p.m.	1/4	440	0	0	300	0	Tornado	Truck on road overturned. Tornado observed by 2 persons.
Ripley, Okla.	23	6:45 p.m.	**300	100	0	1	3,000	0	do	Heavy damage to business houses and to 5 homes. Storm came from west, circled and struck town from north.
Bolton (2 miles southwest of), Montgomery County, Kans.	23	7 p.m.					15,000		Electrical	7-room house and contents burned.
	23									Minor storm also reported near Elk City, Kans.
	23									Minor storms also reported in Pawhuska and Claremore, Okla.
Beebe, Ark.	24	Afternoon					50,000		Wind and rain	Winds estimated at 90 m.p.h., which continued for about 30 minutes, unroofed or damaged practically every place in town.
Eastern Massachusetts and central and southwestern Connecticut	24	Afternoon and evening					50,000		Rains, wind, and hail	Scattered communities experienced heavy rains and resultant street floods, with most wind damage in Middletown, Conn. Crops damaged by rain and hail in Worcester, Mass. and Bristol, Conn., areas.
Arkoma, Le-Flore County, Okla.	24	Afternoon					10,000		Wind	1 house destroyed; several others unroofed.
Albany, Ga.	24	Late afternoon			0	0		0	Tornado (possible) and electrical	Trees and TV antennas heavily damaged by wind in small area. Storm reported as "sounded like a bunch of jets going over". 6 homes struck by lightning and some damage in each instance.
Rome, Sunflower County, Miss.	24	6 p.m.			0	0	15,000	Slight	Tornado	Damaged 2 schools, 3 homes, and 2 barns. Moved southeastward.
Geronimo-Pima area, Ariz.	24	6-7 p.m.	10-12	*3-4				20,000	Hail	Hail average size 3/4 inch in diameter, damaged crops, cotton principally. Storm moved southwestward.
Glenrose Community (east of Billings), Noble County, Okla.	24	9-10 p.m.	2	½			20,000	0	Wind	Damage to several farmsteads.
New Jersey, northern portion	24	Night					30,000		Electrical	Barn and contents burned by lightning strike.
	24									Minor storms also reported at DeValls Bluff, Des Arc, and Carlisle, Ark.
	24-25									Minor storm also reported in Sebastopol, Sonoma County, Calif.
Fairfield, County, S. C.	25				1	1			Electrical	Man reported killed and another injured by lightning while taking shelter under shed.

See footnotes at end of table.

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Corson County, S. Dak.	25	Afternoon	20	*8					Hail	Extensive damage to crops ready for harvest. Path from Hump Butte to Bullhead hardest hit.
Wagon Wheel Gap, Mineral County, Colo.	25	Afternoon					$10,000		Electrical	Bridge destroyed.
Ordway, Crowley County, Colo.	25	Afternoon				1	1,000		do	5 cows killed.
Flagler, Kit Carson County, Colo.	25	Afternoon					75,000	$25,000	Rain	Republican River flooded.
Colorado Springs (10 miles west of), El Paso County, Colo.	25	2:30 p.m.					12,000		Electrical	Fire caused by lightning.
Mildred, Pa.	25	6 p.m.							do	Lightning struck a barn, split heavy beam from roof to floor, and set some shingles afire.
Philadelphia area, Pa.	25	Evening							Winds and rains	Winds felled some trees and wires. Heavy rains flooded underpasses, trapped 3 persons in taxi. Frankford Creek overflowed, flooding a number of business places with several feet of water. Furniture mart estimated damage about $20,000, and automobile tire store estimated damage about $1,500. Street undermined, leaving 25-foot wide hole 15 feet deep.
Sampson County, N. C.	25	8 p.m.						45,000	Hail	Tobacco and cotton damaged.
	25									Minor storm also reported 8 miles south of Cripple Creek, Colo.
	25									Minor storm also reported near Leoti, Kans.
Onida (8 miles south of), Sully County, S. Dak.	26	12:40 a.m.	6	*2					Wind and hail	High velocity wind and 1/2 to 3/4-inch hail caused considerable damage to buildings and crops on 9 farms. Loss of crops mostly on outer edge of path. Buildings destroyed on 1 farm in center of path.
Snow Hill, Md.	26				1				Electrical	1 person killed by lightning while on Chincoteague Bay.
North Dakota, eastern portion	26	Afternoon and evening				1	30,000	Considerable	Hail, wind, and electrical	Struck many areas from Canada to South Dakota line, following 1 of hottest days of year. Some of hardest hit areas include Drayton in Walsh County, Mapleton-Casselton area in Cass County, and general area from Emmons County to Richland County. High wind accompanied many storms to cause considerable property damage. Barn destroyed near Drayton; more than 100 claims from wind damage in Wishek area; several buildings damaged near Kulm. Rural school struck by lightning. 6 or more head of livestock killed by lightning. Hail described as size of walnuts, ping pong balls, or hens' eggs in various areas.
Yadkin County, N. C.	26	2 p.m.						20,000	Hail	Tobacco damaged.
Knobs, Fallon County, Mont.	26	4 p.m.	3	18	0	0	600		Tornado	Cut narrow path of damage, missing most buildings, but twisting windmill and damaging fences, etc. Moved northeastward.
Minnesota, northwestern portion	26	P.m.					75,000	425,000	Hail and winds	Moderate to heavy hail that accompanied severe thunderstorms caused extensive damage to small grains in local areas, particularly in vicinities of Stephen, Marshall County, and Barnesville, Clay County, where some fields of grain total loss. Hailstones numerous and covered ground entirely in places. Some hailstones size of hens' eggs. High winds that accompanied storm which moved southeastward resulted in additional losses, reported as considerable.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Dothan, Ala.	26	P.m.				1			Electrical	Lightning struck residence. Woman suffered minor injuries when lavatory pipe burst and sent particles flying in all directions. Roof damaged and attic filled with smoke, but no fire followed. Tall pine standing near house struck. Small fish in pond beneath tree were dying following day, as result of the stroke.
Bemidji and vicinity, Minn.	26	5:45-10 p.m.				1	$3,000		Rains, winds, and electrical	A number of places struck by lightning. Telephone and power services disrupted. Storm moved southeastward. Excessively heavy rains flooded basements and caused numerous washouts. Some growing crops drowned out in low places. Woman injured as she attempted to wade through bumper-deep water in Bemidji. High winds caused some additional damage.
Brenham (3 miles east of), Washington, County, Tex.	26	6 p.m.	1	440			20,400		Wind	Screen of outdoor theater demolished. Barn unroofed. Moved southwestward.
Minnesota, north-central portion	26	7-8 p.m.					15,000		Winds and rains	Many trees uprooted or branches broken off; barns unroofed; hay stacks scattered; telephone and power lines disrupted. Heavy rains accompanied storm.
	26									Minor storm also reported in vicinity of Plentywood, Mont.
	26									Minor storms also reported in Boston, Worcester, and Fitchburg, Mass., and Waterbury, Conn.
Androscoggin, York, Cumberland, and southern Oxford Counties, Maine	27	Afternoon					50,000	$35,000	Hail and electrical	Hail damaged crops in Cornish-Hiram and Hartford areas. Several barns and dwellings damaged by lightning-set fires.
Fowler, Otero County, Colo.	27	Afternoon					1,000	100,000	Hail	Hailstones to 1 inch in diameter.
Loup City (3 miles east of), Nebr.	27	Afternoon				1		Minor	Wind	1 injured when hay rack overturned.
Aurora and Hoffman Heights, Adams and Arapahoe Counties, Colo.	27	2 p.m.	6	*3			1,000,000		Hail and rain	Hailstones to 1 inch in diameter; roofs damaged, paint peeled from houses. Considerable flooding.
Loup City (4 miles west of), Nebr.	27	2:45 p.m.	Short	Narrow	0	0	2,500	Minor	Tornado	Barn destroyed. Moved southwestward.
Beaufort County, N. C.	27	3 p.m.						16,500	Hail	Mostly tobacco in fields damaged.
Hartford County, Conn.	27	Night							do	"Extensive" damage to tobacco crop, from 30 percent to 100 percent in different fields.
	27									Minor storm also reported at Lewistown, Nebr.
	27									Minor storm also reported in Dickinson County, Iowa.
	27									Minor storm also reported near Collyer, Kans.
	27									Minor storm also occurred at Granite Falls and vicinity, Minn.
Byers (10 miles northeast of), Adams County, Colo.	28	Afternoon			0	0			Tornado	Destroyed machine shed and garage. Heavy damage to cars, trucks, and boat. House damaged.

See footnotes at end of table.

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
North Dakota, central and south-central portions	28	Afternoon and evening	15	*2			$10,000	Considerable	Hail, wind, and electrical	One of severest storms began northwest of Linton and extended southeastward to near South Dakota line. Large cattle barn moved 6 inches on its foundation. New double garage exploded, causing only scratches on cars. This could indicate possibility of tornado-like winds in area. Much hail also reported in vicinity of Harvey, Fessenden, and McClusky, causing considerable crop damage. A few buildings struck by lightning in scattered areas, generally causing only minor damages.
Eudora (near), Douglas County, Kans.	28	3:30 p.m.			1				Electrical	Man killed in field.
West Palm Beach, Fla.	28	7 p.m.			0	0	0	$0	Waterspouts	2 small waterspouts observed offshore about 6 miles north of Palm Beach Inlet.
	28									Minor storm also reported in Wapello County, Iowa.
Erie, Pa.	29	4 p.m.	Short	Narrow	0	0			Tornado, winds, and rain	Tornado funnel with noise like jet plane and electric motor; accompanying wind up to 80 m.p.h. struck southeastern Erie. Moved southeastward, then northward along erratic-weaving path. Ripped up trees, did much minor damage to shingles, eavespouts, windows, lawn furniture, etc. Heavy rains following it caused much local flooding.
Luverne and vicinity, Minn.	29	4:30-6:15 p.m.	20	*6			1,000,000	1,500,000	Hail and rains	Exceptionally heavy hail accompanied severe thunderstorms. Hailstones as large as golf balls common; some size of baseballs and a few measuring 12 inches in circumference reported. Hail which lasted over 15 minutes was preceded by unusual darkness, thunder squalls, and heavy rains. Hailstones unusually numerous and covered ground entirely in places. Numerous windows and neon signs broken; Some greenhouses left in shambles; many automobile tops punctured and paint chipped from cars; roofs and sidings of homes damaged; much poultry and some livestock perished; gardens and growing crops damaged severely; leaves stripped from trees and large impressions driven into lawns. Storm moved northeastward.
Wagner (6 miles south of), Charles Mix County, S. Dak.	29	4:30 p.m.	5	*2	0	0			Tornado and hail	Buildings on 12 farms damaged. Threshing machine turned over. 2 steel wagons carried across road. Crops damaged. Light hail damage.
Minehaha County, S. Dak.	29	5 p.m.	20	*6					Hail and wind	Hail damage to crops, buildings, and cars was great from Baltic, east-southeastward across State line. Greatest damage to crops was in 6- to 8-mile strip west of Baltic to Valley Springs. 3-inch hail found. Cattle injured, plate-glass windows broken, cars dented, and roofs damaged. 2 inches of rain fell.
Litchfield, New Haven, and Hartford Counties, Conn.	29	5-5:30 p.m.							Hail, electrical, wind, and rain	Heavy hail damage to tobacco fields. Severe wind damage to utility lines especially in Waterbury.
Globe, Ariz.	29	6-7:30 p.m.	1-1/4	440		10	1,000,000		Rain	Heavy thunderstorm caused major flood. A wall of water, resulting from flash flood, caused greatest damage in 2 blocks of business district where 25 business buildings destroyed and 40 others damaged. Minor structural damage to residences, greatest loss to house furnishings. 126 families suffered loss.
	29									Minor storm also reported between Bristow and Lynch, Nebr.
Iowa, northern portion	30	Afternoon				1	50,000		Wind, rain, and electrical	Wind and heavy rain downed trees and power and phone lines. Windows shattered. Lightning destroyed large barn and contents and damaged several homes.
Elgin and vicinity, Wabasha County, Minn.	30	1:30 p.m.	5	*2			12,000	8,000	Winds and rains	A number of trees uprooted; grain shocks scattered; portion of roof and wall of large barn torn off; outbuildings damaged; windmill blown down; automobile damaged by falling tree. Heavy rains accompanied storm which moved southeastward.

See footnotes at end of table.

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Owatonna (vicinity of), Minn.	30	P.m.						$10,000	Hail and rains	Light to heavy hail accompanied severe thunderstorms. Heavy rains accompanied storm.
Lambert (large area near), Mont.	30	2 p.m.	35	*10				100,000	Hail	Light to heavy hail damaged crops about 50 percent.
Omaha, Nebr.	30	Late afternoon			1		Few thousand		Wind	Man blown from roof of house and killed.
York (west of), Nebr.	30	4 p.m.	2	850	0	0	$15,000	Minor	Tornado	5 sets of farm buildings badly damaged, some destroyed. Moved east or east-northeastward.
Lodi and vicinity, Wis.	30	7 p.m.	8	200	0	0	80,000		Tornado (possible), rain, and electrical	Excessively high wind lasted 5 minutes. Rain, thunder, and lightning intermittently until 11 p.m. Rough white cloud traveling at high speed alternately skipping and bouncing on ground reported. Malformed funnel observed. Trees in Lodi twisted and uprooted. Plate-glass windows sucked out and pulverized. Many homes and other buildings damaged. Cloud formation and path of destruction traveled to east-southeast. Grain and corn fields in path of storm severely damaged with no estimate of damage available.
Mayville (near), Wis.	30	8 p.m.					20,000	3,500	Electrical	Lightning set fire to large dairy barn and annex, destroying barn, 1200 bushels of oats, and this year's hay crop.
Racine County (western portion), Wis.	30	9:30 p.m.					10,000		Wind	Barn collapsed by wind gusts, trapping 65 head of cattle. Coast Guard at Racine observed wind up to 50 m.p.h.
Haxtun, Phillips County, Colo.	30	Night					10,000		Electrical	Fire caused by lightning damaged barn.
	30									Minor storm also reported at Green Bay, Wis.
	30									Minor storms also reported in vicinities of Fremont and Hartington, Nebr.
	30									Minor storm also reported in Carroll County, Iowa.
Erie area, Pa.	31	Early morning					°61,500		Electrical	Lightning struck and burned 2-story barn and contents with estimated damage of $50,000. Radio tower, garage, and another barn suffered about $500 damage, and utility companies estimated $1,000 damage.
Muskegon and Grand Haven to northwestern Kent County, Mich.	31	Early morning				8	°150,000		Wind and electrical	Well-developed squall line orientated north to south moved across area with reported winds up to 100 m.p.h. at times. At Camp Claybanks, 200 soldiers had their tents blown away. High winds damaged sailboats and roofs of buildings. Barn near Sparta, valued at $8,000, burned to ground; also house in Muskegon, as result of lightning. Falling trees damaged property; many antennas blown down.
Ohio, scattered areas	31	A.m.-p.m.					°25,000		do	General wind damage. Lightning caused some damage to buildings.
Central and southern Maine, southern New Hampshire and Vermont, and Massachusetts	31	Afternoon and evening			2	1	°500,000		Winds, rains, hail, and electrical	High winds, heavy rains, and hail wrought widespread damage as thunderstorms buffeted numerous localities. Estimated $100,000 wind damage in southern Maine alone. Very heavy utility damage and many street floods. Scores of barns and dwellings damaged or destroyed by lightning-set fires. Small craft capsized along coasts. Stratford, N. H. couple killed in lightning-set fire, and Haverhill, Mass., man suffered minor lightning injury. Massachusetts tobacco fields damaged by wind and hail.
New York, eastern portion	31	Afternoon							Electrical and wind	In section extending from Montgomery County eastward to Washington and Warren Counties, strong winds accompanying series of thunderstorms caused thousands of dollars damage to utility lines, buildings, and crops. Trees fell on homes and automobiles.
Waverly-Owego area, N. Y.	31	Afternoon				6			Electrical, rain, and wind	Violent windstorm accompanied by rain injured 6 persons and caused heavy damage. Trees uprooted and fell on homes and automobiles. A few buildings demolished by wind alone.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Durham, Wilkes, and Buncombe Counties, N. C.	31	3-4 p.m.						$18,000	Hail	Tobacco damaged.
Guilford and Richmond Counties, N.C.	31	4 p.m.						16,500	Hail and wind	Tobacco damaged.
Derry and Hampstead, Rockingham County, N. H.	31	4:15 p.m.	4	70	0	0	$25,000	0	Tornado	Small tornado, traveling southeastward, did bulk of damage to trees and cottages along shore and on 2 islands in Island Pond.
Granite City, Ill.	31	4:30 p.m.			1	13			Wind and electrical	Grandstand unroofed and reviewing stand collapsed during ceremonies. At Noble boy killed when lightning struck nearby tree.
Pittsburgh, Pa.	31	5-6 p.m.							Electrical, winds, and rain	Lightning struck a number of houses with mostly minor damage. Trees felled by wind and/or lightning tore down wires, damaged buildings. Heavy rains caused temporary flooding in several sections and set off a minor landslide across 1 boulevard.
Belen (6 miles south of), N. Mex.	31	5:30 p.m.	4	300	0	0	500		Tornado	Mostly over fields and orchards. Considerable damage to orchards; slight damage to outbuildings. 2 separate funnels reported. Moved southeastward.
Dime Box (near), Lee County, Tex.	31	8 p.m.					12,000		Electrical	Church fired by lightning and burned to ground. Storm moved northwestward. Damage in Hranice Community.
Quakertown, Pa.	31	8 p.m.			0	5			Rain, winds, and tornado	Localized wind- and rainstorm limited to about a 2-mile area had "twister-like" winds that struck and severely damaged carnival, then skipped about 6 blocks and did further damage. Winds estimated about 60 m.p.h. Nearly 50 persons trapped when winds nearly leveled carnival, but only 5 seriously injured; many had minor bruises or brush burns. Wall of newly built church felled by storm.
Passaic and Bergen Counties, N. J.	31	Night				2			Electrical and wind	Strong thunderstorm gusts uprooted trees, damaging buildings and automobiles. Utility lines broken. Barn burned by lightning with 2 firemen injured by exploding oil.
	31									Minor storm also reported in Indianapolis, Ind.
	31									Minor storm also reported in Pikesville, Md.
	31									Minor storms also reported in Pawnee County, and Utica and Beaver Crossing areas, Nebr.

* Miles instead of yards.

** Yards instead of miles.

° Crop damage included with other property damage.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

JULY 1954

The most damaging flood during the month was the flash flood in the Ohio Basin in West Virginia. The damages in this flood were estimated at approximately 2 million dollars. Residents compared the rainfall and stream flow of tributaries in the upper Miami Basin in Ohio to that of the great flood of 1937. Flooding elsewhere was comparatively minor.

Record to near-record low stages were reached at several points throughout the Country.

ATLANTIC SLOPE DRAINAGE.--Streams in the Atlantic Slope drainage remained low throughout the month. The stage of the Delaware River at Trenton, N.J., equalled the previous record low stage of -0.4 foot established in 1944 (51 years of record).

In the Altamaha River Basin, the first half of the year was the driest of record. No new record low stages were established, but at Doctortown, Ga., the previous record low stage of -2.3 feet was equalled on July 12-17 and 21-24.

EAST GULF OF MEXICO DRAINAGE.--Record to near-record low stages were reached on streams in the East Gulf of Mexico drainage. The stage of 1.2 feet at Marion Junction, Ala., on the Cahaba River on July 31 was the lowest July stage of record (1939-1954). The previous low July stage was 1.45 feet on July 28-31, 1952 (the driest July of record in Alabama). A stage of 4.25 feet on the 9th at Millers Ferry, Ala., on the Alabama River was the lowest July stage of record, 1939-1954. The previous low July stage was 4.8 feet on July 1, 1941, and July 30, 1952.

Upper Mississippi.--Minor flooding occurred in the Kickapoo River early in July due to excessive rains (2.75 inches) on July 2, 3, and 4. Near bankfull stage was reached on the Trempealeau River at Dodge, Wis. Most of the damage to crops resulted from excessive rains instead of actual flooding.

The Des Moines River from Tracy to the mouth, and the Iowa River from Wapello to the mouth, were above flood stage but receding as the month began.

Missouri Basin.--A record low stage of -0.43 foot was reported on the Kansas River at Wamego, Kans., on the 31st. The previous record low stage was 0.5 foot on August 2, 1940.

Ohio Basin.--A severe flash flood occurred on the Cherry River, a tributary of the Gauley River, at Richwood, W. Va., on the 19th. The drainage area above Richwood is estimated to be 90 square miles. This flood was due to heavy rainfall (3.6 inches at Richwood) that began during the evening of the 18th and ended during the morning of the 19th. It was 1 foot higher than the flood of 1952 at Richwood, and about 4 feet higher than the flood of record at Fenwick, W. Va.

Approximately 100 houses and 13 business establishments in Richwood were flooded to depths ranging from 1 to 8 feet, and 15 houses were destroyed. About 50 automobiles were inundated and severely damaged by the swift current and debris. One of the two hospitals that serve the area was flooded to a depth of several feet on the first floor. The other hospital was completely surrounded by water and sustained extensive damage to its central heating system. Three highway bridges, which were a part of the city street system, and a railroad bridge were destroyed by the flood. All utilities failed and business activities of the town were generally suspended. The Cherry River Lumber Company suffered heavy damage to its plant and to its logging railroad along both the north and south forks of the Cherry River. One other plant suffered extensive damage to its equipment. At Fenwick several houses were damaged by the flood, some of which were destroyed. At this point also a large lumber storage yard was flooded to depths ranging from 1 to 4 feet, and a large portion of the lumber was washed away. There was very little rural damage along the Cherry River because the valley is narrow and has only a few places suitable for gardens. There was no damage reported from lowland flooding from the mouth of the Cherry River to the vicinity of Belva, W. Va. Belva is located 5.5 miles above the mouth of the Gauley River where the flood plain widens and houses have been built along the river bank, mostly on the left or north side. Approximately 8 houses were flooded, but the amount of damage was light. There was very little flooding in the valley, mostly small gardens along the river bank. At Camden-on-Gauley, W. Va., Coon Creek, a tributary of the Gauley River, was out of its banks in the town, flooding three houses. While a family was cleaning its house after the flood a small child fell into the flood water in the yard and was drowned. The amount of damage to the three houses was small. There was some minor flooding on Big Clear Creek (flows into the Meadow River, a tributary of the Gauley) at Anjean and East Rainelle, W. Va. The amount of damage was very light.

On the 19th minor flooding was reported on Laurel Creek, a tributary of the Elk River that flows into this stream 6 miles upstream from Sutton, W. Va. The amount of damage was light. On the same date minor flooding was reported on the Birch River, another tributary of the Elk that flows into this stream about 19 miles downstream from Sutton. The amount of damage was light.

On the 21st heavy rains fell again in the headwaters of the Elk River, causing minor flooding at Clay, W. Va.

Heavy rains during the night of the 20th caused flooding on the 21st on the Little Miami River at King's Mills, Ohio. At Wilmington, Ohio, 4.1 inches was reported from 6:30 p.m. to 9:30 p.m. An additional 1.25 inches was reported at the 7 a.m. observation on the 21st, making a storm total of 5.35 inches at Wilmington. The rainfall was considerably lighter at other points in the basin. The heaviest damage occurred in the upper reaches of Todd's Fork, Turtle Creek, Cowan Creek, and East Fork. Residents compared the rainfall and stream flow in these tributaries to the Great Ohio Flood of 1937. Lake Cowan is said to have risen 9 feet in 1/2 hour. Boats securely tied down were all or partially submerged as their bows were held down while their sterns floated up. One boat was washed over the spillway.

Arkansas Basin.--Streams in the Arkansas Basin remained at low stages throughout most of the month. A record low mean monthly stage of 2.6 feet was reported on the Arkansas River at Tulsa, Okla. The previous lowest mean monthly stage for any month was 2.7 feet in July 1934 and January 1940. The normal stage for July is 5.6 feet.

WEST GULF OF MEXICO DRAINAGE.--The Sabine River in Texas remained low throughout the month. Lake Fork (tributary of Sabine) went dry on the 10th and continued dry throughout the remainder of the month. The Calcasieu River at Oakdale, La., did not rise to the zero of the gage, but remained at sandbar level from the 24th through the 28th.

Extremely low stages were reported on the Guadalupe River in Texas throughout the month. The lowest stage (1.75 feet) was recorded at Victoria on the 30th. This was the lowest stage reported at this point since the gage was moved on November 1, 1934.

Columbia Basin.--The Columbia River receded to below flood stage at Vancouver, Wash., on the 23d. It had been in flood since May 20, a period of 65 days. Due to backwater from the Columbia, the Willamette at Portland was above flood stage for 34 days.

FLOOD STAGE DATA

Table 5

(All dates in July unless otherwise specified)

JULY 1954

River and station	Flood stage	Above flood stages -dates		Crest *	
		From–	To–	Stage	Date
	Ft.			Ft.	
MISSISSIPPI SYSTEM Upper Mississippi Basin					
Kickapoo: Steuben, Wis.	7	7	7	9.25	7
Iowa: Wapello, Iowa	10	June 28	1	12.0	June 29
Des Moines:					
Tracy, Iowa	14	June 23	1	22.1	June 27
Eddyville, Iowa	15	June 24	1	23.2	June 27
Ottumwa, Iowa	9	June 25	1	16.8	June 28
Mississippi:					
Hannibal, Mo.	16	1	3	16.5	2
Louisiana, Mo.	15	2	4	15.6	4
Dam 24 (Clarksville, Mo.)	23	June 30	5	25.2	3
Dam 25 (Winfield, Mo.)	23	June 30	6	25.1	4
MISSISSIPPI SYSTEM (Cont'd.) Ohio Basin					
Paint Creek: Bourneville, Ohio	10	21	21	12.6	21
Little Kanawha: Glenville, W.Va.	23	19 20	20 22	24.7 24.5	23 20
Gauley: Belva, W. Va.	20	19	19	24.8	19
Elk: Clay, W. Va.	18	21	21	19.7	21
Little Miami: Kings Mills, Ohio	17	21	21	17.4	21
Columbia Basin					
Columbia: Vancouver, Wash.	15	May 20	23	20.0	June 19

* Provisional

RADIOSONDE DATA

Average monthly values

Table 20

JULY 1954

Standard pressure surface (mb.)	ALBUQUERQUE N. MEX. (840 MB.)				ATLANTA, GA. (982 MB.)				BISMARCK, N. DAK. (954 MB.)				BOISE, IDAHO (912 MB.)				BROWNSVILLE, TEX. (1013 MB.)				BUFFALO, N. Y. (992 MB.)				BURRWOOD, LA. (1015 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,619	25.6	38	31	309	25.9	72	31	505	22.7	71	31	868	27.9	32	31	7	27.0	81	31	221	19.5	73	31	3	27.4	82
1000	31	38			31	143			31	92			31	43			31	122	26.4	81	31	114			31	134	28.9	78
950	31	507			31	598	26.0	80	31	547	22.3	66	31	510			31	579	24.2	69	31	559	19.8	58	31	590	24.2	76
900	31	1,000			31	1,075	23.5	60	31	1,015	22.0	52	31	987	29.1	23	31	1,047	22.3	59	31	1,022	16.7	84	31	1,081	21.6	72
850	31	1,507			31	1,571	19.9	62	31	1,509	19.4	50	31	1,492	25.9	19	31	1,542	19.9	52	31	1,508	12.8	89	31	1,555	18.8	68
800	31	2,043	24.3	35	31	2,091	16.0	67	31	2,029	16.5	47	31	2,020	21.1	23	31	2,082	18.9	48	31	2,012	9.3	89	31	2,075	15.8	62
750	31	2,605	20.1	38	31	2,640	12.2	68	31	2,579	13.0	44	31	2,580	16.3	27	31	2,613	13.8	48	31	2,549	8.8	55	31	2,822	12.8	59
700	31	3,194	15.0	46	31	3,213	8.9	58	31	3,151	9.2	44	31	3,155	11.3	32	31	3,186	9.7	49	31	3,109	3.7	48	31	3,198	9.1	58
650	31	3,813	9.6	56	31	3,829	5.4	54	31	3,767	5.1	41	31	3,773	6.2	37	30	3,801	6.0	49	31	3,710	.7	41	31	3,808	5.5	55
600	31	4,475	3.9	66	30	4,475	1.8	49	31	4,409	.8	41	31	4,418	.8	43	30	4,450	2.1	46	31	4,347	- 2.7	39	31	4,458	1.9	51
550	31	5,177	- 1.6	71	29	5,175	- 2.4	47	31	5,103	- 4.1	39	31	5,115	- 4.4	43	30	5,151	- 2.0	43	31	5,031	- 7.1		31	5,155	- 2.2	51
500	31	5,929	- 6.4	64	29	5,922	- 7.0	46	30	5,848	- 9.2	38	31	5,855	- 9.3	35	30	5,899	- 8.4	37	31	5,768	-11.8		31	5,908	- 8.8	50
450	31	6,759	-11.2	54	28	6,750	-12.1	39	30	8,667	-14.6	33	31	6,675	-14.4		30	6,724	-11.3	35	30	8,571	-17.5		31	6,735	-11.8	44
400	30	7,642	-16.3	37	27	7,628	-17.9		30	7,537	-21.0		31	7,548	-20.8		30	7,610	-17.3	37	30	7,437	-23.7		31	7,815	-17.5	43
350	30	8,632	-23.3		26	8,611	-25.2		29	8,509	-28.0		31	8,520	-27.9		29	8,597	-24.4	39	30	8,397	-31.3		31	8,802	-24.3	41
300	30	9,740	-32.0		26	9,710	-33.8		29	9,597	-35.9		30	9,606	-36.0		29	9,701	-33.0	37	30	9,471	-39.3		31	9,708	-32.8	40
250	29	11,000	-42.0		26	10,960	-43.5		28	10,838	-44.9		30	10,848	-44.7		29	10,956	-43.2		30	10,697	-48.9		31	10,982	-42.7	
200	29	12,473	-53.8		26	12,424	-54.6		28	12,300	-53.9		30	12,312	-53.5		29	12,422	-54.9		30	12,154	-53.3		31	12,428	-54.7	
175	29	13,318	-59.9		26	13,266	-60.7		28	13,148	-58.2		30	13,164	-57.1		29	13,264	-81.0		30	13,007	-58.2		31	13,289	-81.1	
150	29	14,266	-65.8		24	14,216	-66.3		28	14,109	-61.7		29	14,128	-80.3		29	14,206	-67.3		29	13,984	-58.4		31	14,211	-87.2	
125	27	15,359	-70.3		16	15,304	-69.4		27	15,231	-62.9		27	15,263	-62.5		28	15,291	-71.5		24	15,124	-59.8		30	15,298	-70.9	
100	26	16,681	-70.2		11	16,644	-68.5		26	16,601	-61.9		22	16,634	-61.5		25	18,607	-70.2		12	18,517	-58.2		22	18,822	-89.2	
80	23	18,021	-65.9		9	18,002	-62.8		25	17,994	-58.5		13	18,014	-58.4		23	17,938	-87.8						20	17,964	-68.0	
60	20	19,791	-59.6		8	19,793	-58.4		23	19,818	-55.1		7	19,832	-55.7		19	19,682	-81.5						18	19,728	-81.7	
50	19	20,938	-57.1		7	20,944	-56.9		22	20,986	-53.3		7	20,995	-54.5		17	20,827	-57.8						14	20,885	-59.2	
40	18	22,360	-54.0		5	22,346	-54.5		19	22,429	-51.1		7	22,430	-52.5		10	22,242	-53.8						10	22,287	-55.8	
30	13	24,227	-50.7		5	24,200	-51.3		14	24,307	-48.5						6	24,107	-51.0									

Standard pressure surface (mb.)	CAMAGUEY, CUBA (1002 MB.)				CARIBOU, ME. (988 MB.)				CHARLESTON, S. C. (1014 MB.)				COLUMBIA, MO. (986 MB.)				DODGE CITY, KANS. (923 MB.)				EL PASO, TEX. (881 MB.)				ELY, NEV. (810 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	22	122	23.3	95	31	191	15.1	88	31	13	25.2	85	31	238	28.4	50	31	792	29.7	38	31	1,195	29.5	34	31	1,908	23.6	33
1000	22	142	23.5	92	31	87			31	138	26.1	78	31	106			31	64			31	41			31	22		
950	22	593	23.7	76	31	525	14.9	76	31	598	24.4	64	31	569	29.1	48	31	532			31	515			31	499		
900	22	1,065	21.5	66	31	979	12.5	72	31	1,063	22.1	62	31	1,045	26.4	47	31	1,014	30.2	33	31	1,003			31	985		
850	22	1,559	18.5	65	31	1,457	9.4	74	31	1,558	18.7	65	31	1,547	22.7	51	31	1,522	28.7	34	31	1,509	27.8	31	31	1,485		
800	22	2,078	15.4	59	31	1,957	6.2	76	31	2,076	15.1	64	31	2,072	19.1	52	31	2,053	22.5	40	31	2,042	23.8	35	31	2,020	25.0	28
750	22	2,625	12.2	52	31	2,492	2.9	76	31	2,830	11.9	60	31	2,632	15.2	52	31	2,613	18.0	45	31	2,604	18.6	43	31	2,588	20.7	26
700	22	3,196	8.7	49	31	3,039	- .3	69	31	3,195	8.8	54	31	3,204	11.1	53	31	3,197	13.1	50	31	3,187	13.3	51	31	3,173	15.4	29
650	22	3,810	4.5	53	31	3,633	- 3.7	64	31	3,815	5.2	49	31	3,828	7.0	51	31	3,818	8.1	52	31	3,807	7.8	63	31	3,798	9.8	38
600	22	4,452	.5	49	31	4,257	- 7.3	58	31	4,455	1.4	49	31	4,472	2.8	49	31	4,471	3.5	49	31	4,480	2.4	67	31	4,453	3.8	45
550	22	5,147	- 3.3	48	30	4,937	-11.3	51	31	5,157	- 2.6	43	31	5,175	- 1.7	41	31	5,175	- 1.1	47	31	5,180	- 2.1	54	31	5,157	- 2.3	53
500	22	5,893	- 7.9	45	30	5,658	-16.1	50	31	5,900	- 7.1	41	31	5,923	- 6.2	35	30	5,926	- 5.7	42	31	5,909	- 6.7	49	31	5,903	- 7.9	53
450	22	6,710	-12.9	42	30	6,451	-21.9	48	30	6,729	-12.0	38	31	8,751	-11.5		30	8,756	-10.8	34	31	8,740	-11.4	42	31	8,729	-13.0	42
400	22	7,594	-19.0	43	29	7,299	-27.7	46	30	7,608	-17.8	37	31	7,632	-18.0		30	7,641	-17.0		30	7,620	-17.1		31	7,604	-18.7	
350	22	8,575	-25.3	38	29	8,244	-34.4	43	30	8,593	-29.9		31	8,615	-25.5		30	8,628	-24.0		30	8,808	-24.4		31	8,585	-25.8	
300	22	9,674	-33.8		29	9,303	-41.8		30	9,694	-33.4		31	9,713	-33.9		30	9,734	-32.5		30	9,709	-33.1		31	9,883	-34.2	
250	21	10,926	-43.7		29	10,516	-48.4		30	10,946	-43.3		31	10,964	-43.8		30	10,992	-42.4		29	10,982	-43.2		30	16,931	-43.9	
200	21	12,388	-55.3		29	11,979	-48.8		30	12,410	-55.0		31	12,425	-55.3		30	12,463	-53.7		29	12,425	-55.1		30	12,394	-54.7	
175	21	13,227	-61.7		29	12,856	-49.1		30	13,251	-61.2		31	13,285	-61.0		29	13,307	-59.8		29	13,265	-61.1		30	13,238	-80.2	
150	21	14,168	-66.7		29	13,863	-50.3		29	14,196	-66.3		30	14,207	-66.2		29	14,255	-65.7		27	14,208	-67.2		30	14,185	-85.3	
125	20	15,263	-68.7		29	15,048	-51.5		29	15,291	-69.3		29	15,301	-69.9		28	15,351	-70.1		25	15,289	-71.8		28	15,283	-68.3	
100	15	16,589	-70.1		29	16,491	-52.7		29	16,627	-67.1		26	16,831	-68.0		25	18,674	-88.8		23	18,601	-70.8		23	18,825	-88.5	
80	12	17,910	-69.8		26	17,933	-52.8		29	17,985	-63.4		24	17,989	-63.5		23	18,018	-84.2		23	17,937	-85.8		19	17,987	-82.4	
60	11	19,658	-62.5		24	19,789	-51.7		29	19,771	-58.9		22	19,774	-58.8		22	19,802	-58.3		22	19,710	-59.9		18	19,785	-57.2	
50	10	20,790	-59.9		24	20,972	-51.0		25	20,914	-57.1		22	20,928	-55.8		22	20,955	-55.8		21	20,852	-57.7		18	20,943	-55.2	
40	7	22,191	-57.4		23	22,424	-50.1		23	22,337	-54.4		21	22,358	-53.1		21	22,381	-53.8		19	22,267	-54.2		15	22,389	-52.7	
30					16	24,305	-48.5		19	24,193	-51.9		15	24,234	-50.0		15	14,228	-50.5		14	24,129	-51.0		12	24,240	-50.1	
20					6	26,984	-46.8		8	26,819	-49.9																	

Standard pressure surface (mb.)	GLASGOW, MONT. (937 MB.)				GRAND JUNCTION, COLO. (852 MB.)				GREAT FALLS, MONT. (887 MB.)				GREEN BAY, WIS. (990 MB.)				GREENSBORO, N. C. (985 MB.)				HATTERAS, N. C. (1015 MB.)				HILO, T. H. (1014 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	648	24.9	42	30	1,474	27.3	34	31	1,128	23.4	40	31	210	19.5	78	31	273	23.3	78	31	3	24.9	85	31	9	28.0	71
1000	31	70			30	27			31	55			31	120			31	136			31	133	24.4	82	31	138	22.9	72
950	31	527			30	501			31	522			31	571	20.4	84	31	594	24.9	59	31	587	22.4	71	31	582	19.4	78
900	31	1,001	23.1	39	30	986			31	995			31	1,030	17.5	85	31	1,061	22.1	58	31	1,052	19.9	88	31	1,045	18.1	80
850	31	1,496	19.9	40	30	1,495	27.2	33	31	1,490	22.0	34	31	1,516	14.8	65	31	1,555	18.5	62	31	1,543	17.1	85	31	1,529	13.0	84
800	31	2,018	16.4	40	30	2,030	25.1	32	31	2,012	18.0	37	31	2,027	12.2	80	31	2,072	14.7	68	31	2,058	14.1	60	31	2,037	10.9	74
750	31	2,569	12.6	42	30	2,595	20.5	36	31	2,567	13.7	41	31	2,574	9.6	49	31	2,818	11.2	64	31	2,808	10.9	59	31	2,585	9.3	58
700	31	3,136	8.6	42	30	3,183	15.5	42	31	3,138	9.1	46	31	3,136	8.9	42	31	3,188	8.1	54	31	3,173	7.9	50	31	3,145	7.4	41
650	31	3,750	4.3	42	30	3,805	10.0	52	31	3,749	4.1	53	31	3,744	3.5	41	31	3,804	4.8	46	31	3,788	4.6	47	31	3,757	4.9	
600	31	4,391	- .3	40	30	4,465	4.3	62	31	4,393	- 1.1	55	31	4,387	- .4	43	31	4,445	1.2	42	31	4,428	1.0	43	31	4,401	1.9	
550	31	5,082	- 5.2	40	30	5,168	- 1.1	64	31	5,081	- 6.0	45	31	5,076	- 4.8	40	31	5,145	- 2.9	38	31	5,125	- 3.1	39	30	5,101	- 1.5	
500	30	5,823	-10.5	36	30	5,921	- 6.4	82	31	5,820	-11.4	44	31	5,821	- 9.5		31	5,889	- 7.3	34	31	5,871	- 7.5	39	30	5,853	- 8.2	
450	30	6,639	-16.2	35	30	6,749	-11.4	49	31	8,630	-17.1	36	31	6,639	-14.6		31	6,716	-12.5	33	31	6,896	-12.5	33	30	8,882	-11.9	
400	30	7,503	-22.1	35	30	7,632	-16.9	42	31	7,493	-22.9	38	31	7,509	-20.7		31	7,592	-18.3		30	7,574	-18.4	32	30	7,560	-18.4	
350	30	8,470	-29.3		30	8,619	-24.0	45	31	8,457	-30.3	39	31	8,482	-27.6	35	31	8,574	-25.2		30	8,558	-25.5		29	8,538	-28.4	
300	30	9,551	-37.6		29	9,725	-32.2	45	30	9,536	-38.1		30	9,573	-35.7		31	9,674	-33.4		30	9,655	-33.7		29	9,830	-35.4	
250	30	10,783	-46.3		29	10,984	-42.1		30	10,767	-46.7		30	10,815	-44.9		31	10,927	-43.0		30	10,908	-43.2		29	10,872	-45.0	
200	30	12,239	-53.4		29	12,455	-54.1		29	12,225	-54.3		30	12,277	-53.7		31	12,398	-53.7		30	12,373	-53.9		29	12,325	-56.1	
175	30	13,091	-56.5		28	13,297	-60.3		29	13,076	-56.9		30	13,127	-57.4		31	13,243	-59.0		30	13,217	-59.8		28	13,186	-81.8	
150	26	14,062	-59.0		28	14,243	-66.2		29	14,047	-59.8		30	14,093	-60.8		31	14,196	-84.4		29	14,166	-65.5		27	14,108	-87.0	
125	26	15,200	-80.0		23	15,333	-69.2		26	15,182	-60.2		29	15,218	-61.8		29	15,300	-66.5		26	15,263	-88.3		27	15,192	-72.4	
100	26	16,593	-59.4		20	16,664	-68.1		26	16,575	-59.7		29	16,598	-61.2		27	16,651	-84.4		23	16,807	-85.9		27	16,500	-72.5	
80	26	17,999	-56.5		18	18,015	-63.1		25	17,976	-57.2		26	17,992	-58.6		27	18,025	-60.8		20	17,972	-82.2		28	17,819	-89.5	
60	24	19,832	-53.5		16	19,802	-58.5		23	19,815	-53.5		24	19,811	-55.3		25	19,836	-56.6		19	19,761	-58.1		25	19,554	-84.1	
50	24	21,009	-51.5		14	20,955	-56.2		22	20,992	-52.3		24	20,979	-53.1		24	20,997	-54.8		16	20,916	-58.1		23	20,879	-61.1	
40	24	22,460	-50.5		11	22,388	-53.5		20	22,442	-50.5		22	22,423	-51.3		22	22,428	-52.7		18	22,339	-54.2		21	22,072	-58.5	
30	19	24,335	-48.4		9	24,258	-50.7		17	24,324	-48.8		17	24,301	-49.5		19	24,295	-50.3		10	24,188	-51.7		18	23,882	-58.1	
20	5	26,963	-46.7						10	26,995	-45.8		7	26,938	-48.3		8	26,959	-46.5						5	26,474	-50.0	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

JULY 1954

Standard pressure surface (mb.)	INTERNAT. FALLS, MINN. (972 MB.)				LAKE CHARLES, LA. (1014 MB.)				LANDER, WYO. (830 MB.)				LAS VEGAS, NEV. (933 MB.)				LITTLE ROCK, ARK. (1004 MB.)				MAZATLAN, MEXICO (1008 MB.)				MEDFORD, ORE. (967 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Height	Temperature	Relative humidity
SURFACE	30	360	18.3	77	30	5	28.8	80	31	1,698	24.0	34	31	860	35.3	20	30	79	29.2	62	30	14	28.9	78	31	401	25.9	33
1000	30	111			30	130	27.2	76	31	33			31	20			30	113	29.5	80	30	89	28.2	77	31	103		
950	30	554	19.7	67	30	587	25.5	70	31	500			31	498			30	580	28.8	52	30	553	25.4	73	31	560	24.8	34
900	30	1,020	16.7	67	30	1,059	23.1	61	31	985			31	983	34.0	20	30	1,051	25.5	56	30	1,020	23.2	69	31	1,027	21.1	39
850	30	1,504	13.2	72	30	1,555	20.0	60	31	1,490			31	1,496	29.8	23	30	1,552	21.9	60	30	1,518	20.1	69	31	1,518	17.2	44
800	30	2,012	10.6	69	30	2,075	18.6	61	31	2,023	23.8	26	31	2,031	24.9	27	30	2,078	18.2	62	30	2,039	17.1	68	31	2,032	13.5	49
750	30	2,554	8.1	56	30	2,623	13.2	59	31	2,585	19.2	28	31	2,597	19.9	33	29	2,629	14.5	61	30	2,594	13.9	66	31	2,577	10.3	45
700	30	3,115	5.8	47	29	3,199	9.7	54	31	3,170	14.2	31	31	3,181	14.8	39	29	3,205	10.8	56	30	3,167	10.3	70	31	3,143	7.2	38
650	30	3,720	2.4	46	29	3,812	5.9	51	31	3,788	8.9	38	31	3,803	9.2	44	29	3,824	6.9	48	28	3,786	6.4	71	31	3,752	3.9	
600	30	4,380	- 1.5	43	28	4,461	1.7	48	30	4,444	3.5	44	31	4,459	3.9	47	29	4,473	2.8	43	25	4,434	2.3	71	31	4,395	.2	
550	30	5,048	- 5.7	39	28	5,159	- 2.3	42	30	5,141	- 2.3	51	31	5,163	- 1.1	43	28	5,179	- 1.1	44	22	5,141	- 1.9	67	31	5,088	- 4.0	
500	30	5,787	-10.8		28	5,908	- 6.8	39	28	5,891	- 7.9	51	31	5,913	- 5.8	38	28	5,926	- 5.7	41	21	5,889	- 6.3		31	5,832	- 9.1	
450	30	6,595	-18.2		28	6,734	-11.8	41	27	6,711	-13.8	46	31	6,745	-11.1	34	28	6,758	-10.7	35	13	6,718	-10.9		31	6,647	-14.6	
400	30	7,485	-22.5		28	7,616	-17.4	40	27	7,587	-19.7	39	31	7,826	-17.3		28	7,642	-18.4		9	7,605	-16.7		31	7,520	-21.0	
350	30	8,431	-29.8		28	8,602	-24.2	39	27	8,564	-26.9		31	8,612	-24.7		28	8,631	-23.5		9	8,594	-24.0		31	8,492	-28.3	
300	30	9,511	-37.5		27	9,706	-32.5		26	9,659	-35.1		31	9,714	-33.1		26	9,737	-32.0		8	9,698	-32.2		31	9,579	-36.4	
250	30	10,745	-46.0		27	10,964	-42.4		28	10,903	-44.5		30	10,968	-43.1		25	10,997	-42.0		6	10,949	-42.4		31	10,819	-45.0	
200	30	12,204	-53.7		25	12,432	-54.3		24	12,354	-55.4		30	12,432	-54.8		23	12,474	-53.1						30	12,278	-53.6	
175	30	13,052	-58.5		23	13,279	-60.4		24	13,195	-60.2		30	13,272	-60.8		23	13,320	-59.3						30	13,129	-57.1	
150	28	14,024	-58.5		22	14,222	-67.0		21	14,150	-64.5		30	14,216	-66.6		22	14,269	-65.9						30	14,097	-60.1	
125	27	15,164	-59.6		19	15,306	-71.4		20	15,260	-66.8		27	15,302	-70.6		20	15,360	-70.2						30	15,230	-61.1	
100	26	16,583	-58.4		17	16,819	-70.8		18	16,606	-66.2		22	16,618	-68.5		17	16,685	-68.5						24	16,612	-60.0	
80	25	17,973	-56.4		15	17,955	-68.3		13	17,967	-61.5		18	17,967	-64.1		17	18,035	-64.2						20	18,003	-59.1	
60	22	19,805	-54.0		9	19,716	-61.0		10	19,768	-57.2		17	19,750	-59.3		16	19,820	-58.5						18	19,820	-56.0	
50	20	20,977	-52.8		9	20,853	-58.9		9	20,927	-55.3		16	20,899	-56.0		16	20,974	-55.9						17	20,987	-54.3	
40	15	22,424	-51.1						9	22,358	-53.2		14	22,327	-53.8		15	22,399	-53.7						14	22,427	-52.6	
30	12	24,293	-49.1						7	24,199	-50.6		10	24,189	-50.6		9	24,246	-50.3						11	24,299	-50.0	
20	5	26,949	-46.8																									

Standard pressure surface (mb.)	MERIDA, MEXICO (1012 MB.)				MIAMI, FLA. (1017 MB.)				MIDLAND, TEX. (915 MB.)				NANTUCKET, MASS. (1012 MB.)				NASHVILLE, TENN. (994 MB.)				NORTH PLATTE, NEBR. (918 MB.)				OAKLAND, CALIF. (1013 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	27	26.8	81	31	4	27.0	77	31	871	29.5	36	31	14	17.6	93	31	177	27.5	61	31	849	26.4	55	31	6	17.1	72
1000	31	138	28.1	80	31	150	26.4	74	31	72			31	118	18.8	87	31	126			31	61			31	116	16.2	72
950	31	591	24.1	75	31	602	23.2	74	31	538			31	580	18.4	71	31	584	27.0	52	31	526			31	568	20.7	43
900	31	1,081	21.4	74	31	1,071	20.1	75	31	1,022	29.0	35	31	1,022	16.1	63	31	1,058	23.9	53	31	1,004	28.2	44	31	1,024	22.6	22
850	31	1,555	18.3	73	31	1,582	18.9	72	31	1,529	25.0	41	31	1,506	12.8	68	31	1,555	20.5	54	31	1,509	25.3	42	31	1,519	20.7	22
800	31	2,073	15.3	70	31	2,077	14.1	67	31	2,058	20.7	44	31	2,013	9.8	63	31	2,076	17.1	53	31	2,039	21.7	40	31	2,039	17.8	22
750	31	2,618	12.4	59	31	2,622	11.0	61	31	2,613	16.6	42	31	2,551	7.1	55	31	2,627	13.8	50	31	2,597	17.9	40	31	2,595	14.5	22
700	31	3,194	9.1	54	30	3,192	7.6	60	31	3,196	12.4	41	31	3,111	4.0	53	31	3,202	10.1	48	31	3,180	13.3	42	31	3,166	10.8	26
650	31	3,807	5.3	56	30	3,801	4.1	59	31	3,814	8.0	40	31	3,713	.8	51	31	3,819	6.1	47	31	3,801	8.4	46	31	3,788	6.8	27
600	30	4,454	1.5	52	30	4,448	.5	58	31	4,468	3.6	37	31	4,350	- 2.9	48	31	4,465	2.1	46	31	4,454	3.6	49	31	4,431	2.4	
550	30	5,154	- 2.4	51	30	5,140	- 3.3	51	31	5,174	- .8	34	31	5,038	- 7.0	42	31	5,168	- 1.9	41	31	5,154	- 1.4	45	31	5,131	- 2.9	
500	30	5,902	- 8.7	48	30	5,887	- 7.7	50	31	5,923	- 5.4	35	31	5,772	-11.6	40	31	5,914	- 6.3	37	31	5,907	- 6.3	40	31	5,880	- 6.8	
450	30	6,727	-11.7	45	30	6,710	-12.6	50	31	6,762	-10.4	28	31	6,581	-18.8	33	31	6,745	-11.3		31	6,735	-11.4	33	31	6,704	-12.5	
400	29	7,612	-17.4	38	30	7,590	-18.3	50	31	7,840	-16.3	24	31	7,447	-23.1	34	31	7,624	-17.4		31	7,617	-17.6	32	31	7,583	-18.9	
350	27	8,598	-24.5	40	30	8,573	-25.2	45	31	8,630	-23.6		31	8,411	-30.0		31	8,610	-24.3		31	8,603	-24.8		31	8,563	-26.4	
300	27	9,701	-32.9		30	9,672	-33.8	41	31	9,736	-32.3		31	9,490	-37.7		31	9,714	-32.6		30	9,705	-33.2		30	9,656	-34.6	
250	25	10,955	-43.0		30	10,923	-43.9		31	10,994	-42.3		30	10,724	-45.9		28	10,971	-42.6		29	10,960	-42.7		30	10,904	-43.8	
200	22	12,418	-55.2		30	12,381	-55.8		30	12,465	-53.2		30	12,184	-52.9		28	12,442	-53.6		29	12,429	-54.1		30	12,368	-54.2	
175	22	13,256	-61.5		30	13,220	-61.7		30	13,312	-58.8		30	13,040	-55.4		28	13,288	-59.4		29	13,274	-59.9		29	13,210	-59.7	
150	19	14,191	-67.9		29	14,159	-67.5		30	14,264	-64.9		30	14,016	-58.0		28	14,239	-64.7		28	14,223	-65.7		28	14,163	-64.2	
125	14	15,275	-72.5		28	15,246	-70.3		28	15,361	-70.1		29	15,164	-58.4		28	15,341	-68.5		28	15,319	-69.2		28	15,270	-67.1	
100	11	16,584	-71.6		25	16,570	-69.3		23	16,684	-70.8		29	16,566	-58.2		24	16,679	-66.7		27	16,657	-67.8		27	16,615	-65.8	
80	6	17,895	-69.1		23	17,906	-68.9		23	18,023	-65.7		28	17,977	-56.7		22	18,046	-62.4		27	18,016	-62.5		26	17,981	-62.7	
60					22	19,860	-61.7		22	19,796	-59.6		27	19,808	-54.5		20	19,843	-57.0		27	19,813	-57.8		26	19,768	-58.8	
50					21	20,797	-58.7		22	20,942	-57.2		26	20,978	-53.1		20	21,001	-55.3		24	20,970	-55.3		26	20,917	-56.4	
40					19	22,210	-55.7		16	22,352	-55.2		25	22,422	-51.3		18	22,428	-52.8		20	22,399	-53.3		26	22,341	-53.8	
30					8	24,067	-52.8		11	25,202	-52.2		20	24,302	-49.7		14	24,291	-50.2		15	24,266	-49.6		22	24,197	-51.7	

Standard pressure surface (mb.)	OKLAHOMA CITY, OKLA. (968 MB.)				OMAHA, NEBR. (978 MB.)				PHOENIX, ARIZ. (969 MB.)				PITTSBURGH, PA. (972 MB.)				PORTLAND, ME. (1010 MB.)				RAPID CITY, S. DAK. (903 MB.)				ST. CLOUD, MINN. (977 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	391	29.8	52	31	300	27.6	58	31	338	35.2	37	30	382	21.3	67	31	20	16.4	87	31	966	25.7	43	31	316	20.7	80
1000	31	95			31	102			31	55			30	124			31	106	17.7	78	31	56			31	113		
950	31	562	31.6	39	31	562	27.5	52	31	525	34.4	34	30	574	21.5	63	31	549	17.4	67	31	519			31	565	21.6	68
900	31	1,042	28.5	40	31	1,038	24.8	50	31	1,012	31.1	33	30	1,039	18.7	64	31	1,006	14.6	67	31	1,000	26.4	41	31	1,028	18.8	68
850	31	1,547	24.6	45	31	1,538	22.1	49	31	1,521	27.1	36	30	1,527	15.5	64	31	1,487	11.2	69	31	1,503	24.4	42	31	1,517	16.2	61
800	31	2,074	20.2	50	31	2,060	19.3	42	31	2,053	22.8	40	30	2,039	12.3	62	31	1,990	7.7	69	31	2,031	20.7	44	31	2,031	14.3	51
750	31	2,631	16.1	50	31	2,617	15.8	40	31	2,613	18.1	46	30	2,582	9.5	49	31	2,527	4.4	66	31	2,585	16.5	48	31	2,581	11.9	41
700	31	3,210	12.0	49	31	3,194	11.7	44	31	3,196	13.2	54	30	3,147	6.3	45	31	3,079	1.7	53	31	3,170	12.5	47	31	3,148	8.5	42
650	31	3,830	7.8	47	31	3,816	6.8	49	31	3,821	8.2	60	30	3,753	2.8	45	31	3,677	- 1.2	48	31	3,786	7.8	50	31	3,763	4.7	45
600	31	4,481	3.3	48	30	4,480	2.4	47	31	4,471	3.1	65	30	4,394	- .9	44	31	4,308	- 4.9	48	31	4,441	2.7	51	31	4,405	.5	42
550	31	5,186	- 1.1	41	30	5,159	- 1.9	46	31	5,178	- 1.8	64	30	5,085	- 4.9	34	31	4,992	- 9.0	41	31	5,138	- 2.5	51	31	5,098	- 4.0	37
500	31	5,935	- 5.7	34	30	5,910	- 6.8	40	31	5,923	- 6.6	57	29	5,825	- 9.4		31	5,719	-13.7	36	31	5,888	- 7.6	46	31	5,843	- 9.0	38
450	30	6,770	-10.8	30	29	6,737	-11.8	37	31	6,755	-11.0	44	29	6,640	-14.7		31	6,518	-19.4	35	31	6,713	-12.9	44	31	6,662	-14.4	
400	30	7,649	-16.7		29	7,616	-17.7		31	7,636	-16.4	38	29	7,513	-20.9		31	7,377	-25.7	38	31	7,590	-18.9	39	31	7,533	-20.4	
350	30	8,638	-23.6		28	8,599	-24.9		31	8,627	-23.5	36	29	8,486	-28.1		31	8,330	-32.8		31	8,570	-26.0	39	31	8,507	-27.8	
300	29	9,745	-32.3		27	9,701	-33.4		30	9,735	-32.1		29	9,574	-36.0		31	9,396	-40.8		31	9,666	-34.2	39	31	9,596	-35.9	
250	29	11,003	-42.4		28	10,954	-43.1		30	10,996	-42.0		29	10,816	-44.7		30	10,619	-47.9		31	10,916	-43.6		30	10,837	-45.1	
200	29	12,474	-53.4		26	12,421	-54.0		30	12,471	-53.7		29	12,276	-54.4		30	12,074	-51.6		31	12,380	-54.2		30	12,295	-54.7	
175	29	13,321	-59.1		25	13,262	-59.8		30	13,316	-60.0		29	13,122	-59.0		30	12,938	-52.6		31	13,225	-59.4		30	13,140	-58.6	
150	29	14,272	-65.0		25	14,211	-65.0		29	14,262	-66.3		28	14,079	-62.3		30	13,929	-54.4		31	14,176	-64.2		30	14,100	-61.9	
125	28	15,368	-69.9		25	15,313	-68.1		25	15,356	-70.9		27	15,199	-63.5		30	15,093	-55.4		29	15,285	-66.8		30	15,224	-62.9	
100	27	16,692	-69.3		25	16,654	-66.4		18	16,676	-70.6		26	16,572	-62.0		28	16,513	-55.6		23	16,637	-65.6		28	16,595	-61.7	
80	24	18,042	-64.1		25	18,019	-62.0		13	18,010	-65.1		17	17,952	-59.8		27	17,939	-54.1		23	18,005	-61.2		27	17,986	-58.8	
60	23	19,827	-59.2		23	19,820	-57.2		11	19,786	-58.8		8	19,751	-56.2		26	19,791	-52.6		22	19,809	-56.3		27	19,808	-55.1	
50	19	20,979	-56.1		21	20,977	-54.8		11	20,938	-56.4		7	20,916	-54.0		26	20,970	-51.7		20	20,978	-54.3		26	20,974	-53.1	
40	15	22,409	-53.1		20	22,412	-52.2		10	22,362	-54.2		6	22,350	-52.7		23	22,416	-50.1		14	22,411	-52.4		21	22,422	-51.4	
30	8	24,283	-50.5		13	24,284	-49.8		5	24,219	-51.2						12	24,292	-48.9		10	24,264	-50.1		13	24,290	-49.6	
20					6	26,964	-46.5																		5	26,949	-47.5	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

Standard pressure surface (mb.)	SAN ANTONIO, TEX. (985 MB.)				SAN JUAN, P. R. (1015 MB.)				SANTA MARIA, CALIF. (1005 MB.)				S. STE. MARIE, MICH. (989 MB.)				SPOKANE, WASH. (930 MB.)				SWAN ISLAND, W. I. (1013 MB.)				TACUBAYA, MEXICO (774 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	243	30.3	48	31	19	26.5	82	31	71	16.4	78	31	221	14.5	83	31	722	23.8	30	24	10	26.7	84	23	2,306	17.3	63
1000---	31	109			31	150	25.8	79	31	111	15.8	77	31	129			31	83			24	125	28.1	83	23	56		
950----	31	571	28.7	49	31	605	22.7	80	31	564	21.4	55	31	569	17.3	61	31	537			24	581	23.0	81	23	520		
900----	31	1,048	25.1	55	31	1,071	19.5	81	31	1,022	24.6	32	31	1,027	14.4	61	31	1,008	21.5	32	24	1,046	20.1	76	23	1,000		
850----	31	1,546	21.3	59	31	1,562	16.6	77	31	1,521	22.6	30	31	1,507	11.3	64	31	1,499	17.1	38	24	1,538	17.3	70	23	1,493		
800----	31	2,088	17.7	57	31	2,077	14.5	63	31	2,048	19.3	31	31	2,011	8.2	67	31	2,012	12.6	43	24	2,053	14.4	64	23	2,026		
750----	31	2,616	14.3	50	31	2,825	12.0	46	31	2,602	15.5	34	31	2,552	6.1	55	31	2,553	8.4	45	24	2,603	11.5	55	23	2,578	14.9	63
700----	31	3,196	10.8	45	31	3,196	8.7	43	31	3,178	11.6	38	31	3,105	3.5	48	31	3,116	4.4	46	24	3,170	8.2	52	23	3,154	10.1	72
650----	31	3,811	7.0	42	31	3,808	4.6	40	31	3,798	7.3	40	31	3,709	.5	42	31	3,715	.5	44	24	3,785	4.8	50	23	3,772	5.4	79
600----	31	4,463	3.2	39	31	4,453	.4	40	31	4,446	2.9	34	30	4,341	- 3.2	36	31	4,353	- 3.7	41	24	4,428	1.2	42	23	4,417	.9	81
550----	31	6,165	- 1.1	42	31	5,151	- 2.9	30	31	5,151	- 1.7	32	30	5,026	- 7.5		31	5,033	- 8.2	39	24	5,121	- 3.0	44	23	5,116	- 3.2	78
500----	31	5,918	- 5.9	38	31	5,895	- 7.2	30	31	5,897	- 6.1		30	5,760	-12.3		31	5,768	-12.5	35	23	5,871	- 7.3	43	21	5,860	- 7.3	68
450----	30	6,748	-11.1	31	31	6,724	-12.7		31	6,727	-11.2		30	6,566	-17.7		31	6,570	-18.0		23	6,698	-12.1	41	21	6,688	-10.9	56
400----	30	7,631	-18.8	27	31	7,598	-18.7		31	7,608	-17.4		30	7,429	-23.7		31	7,435	-24.0	35	23	7,578	-17.6	38	19	7,569	-17.5	
350----	30	8,820	-23.8		31	8,579	-26.2		31	8,592	-25.2		30	8,389	-31.0		31	8,396	-31.0		23	8,563	-24.7		18	8,557	-24.5	
300----	30	9,727	-32.3		31	9,673	-34.9		31	9,693	-33.7		30	9,464	-39.0		31	9,470	-39.0		23	9,668	-32.9		15	9,662	-32.9	
250----	30	10,987	-42.3		31	10,919	-44.7		31	10,945	-43.2		29	10,688	-47.0		30	10,693	-46.8		23	10,922	-42.7		15	10,918	-42.9	
200----	28	12,480	-53.4		31	12,375	-56.1		31	12,412	-53.9		25	12,151	-53.0		30	12,151	-52.2		23	12,390	-54.7		14	12,385	-55.4	
175----	27	13,308	-59.2		31	13,213	-61.7		30	13,255	-59.5		21	13,013	-55.1		30	13,010	-54.0		22	13,229	-61.2		14	13,223	-62.0	
150----	25	14,259	-85.1		31	14,156	-88.2		30	14,206	-65.2		18	13,994	-56.9		30	13,996	-55.3		20	14,168	-67.6		13	14,159	-69.1	
125----	22	15,351	-89.6		30	15,251	-69.7		30	15,303	-69.0		15	15,139	-57.1		30	15,157	-56.2		12	15,251	-71.4		9	15,239	-73.5	
100----	20	18,875	-70.1		30	16,569	-72.6		30	16,638	-67.7		10	16,544	-57.0		28	16,575	-56.5		7	16,575	-71.1		5	16,548	-74.8	
80-----	18	18,018	-68.3		25	17,880	-70.1		30	17,992	-64.0		5	17,965	-55.4		28	17,994	-55.4		6	17,888	-69.8					
60-----	16	19,782	-80.9		23	19,617	-63.2		27	19,772	-59.0						28	19,840	-52.7		6	19,627	-62.9					
50-----	15	20,927	-57.6		23	20,747	-60.1		27	20,923	-58.3						27	21,022	-51.1		5	20,751	-59.1					
40-----	15	22,344	-64.9		21	22,146	-57.3		24	22,350	-53.5						22	22,484	-49.7									
30-----	9	24,190	-52.1		14	23,995	-54.0		14	24,200	-51.5						18	24,374	-48.0									

Standard pressure surface (mb.)	TAMPA, FLA. (1016 MB.)				TATOOSH ISLAND, WASH. (1015 MB.)				VERACRUZ, MEXICO (1010 MB.)				WASHINGTON, D. C. (1004 MB.)			
SURFACE	31	9	25.3	88	30	31	12.5	90	11	13	28.4		31	88	23.2	88
1000---	31	149	25.8	81	30	152	11.9	87	11	102	27.7		31	124	23.5	60
950----	31	803	23.4	78	30	587	10.6	77	11	549	24.5		31	577	23.3	56
900----	31	1,072	20.5	77	30	1,030	8.9	71	11	1,029	21.5		31	1,044	20.1	58
850----	31	1,585	17.6	77	30	1,502	7.0	66	11	1,522	18.4		31	1,535	16.3	62
800----	31	2,081	14.5	74	30	1,998	4.8	58	11	2,040	15.4		31	2,047	12.5	65
750----	31	2,629	11.4	70	30	2,528	2.5	53	11	2,590	11.9		31	2,593	9.3	59
700----	31	3,199	8.4	83	30	3,078	- .1	49	11	3,159	8.4		31	3,156	6.2	51
650----	31	3,815	5.0	80	30	3,671	- 3.3	49	11	3,774	5.2		31	3,764	3.1	44
600----	31	4,458	1.4	60	30	4,297	- 6.9	47	11	4,418	1.5		30	4,402	- .5	40
550----	31	5,180	- 2.4	57	30	4,974	-10.9	43	11	5,113	- 2.3		30	5,096	- 4.4	
500----	31	5,905	- 8.7	56	29	5,701	-15.5		11	5,866	- 6.5		30	5,838	- 8.8	
450----	31	6,734	-11.8	49	29	6,494	-20.6		11	6,694	-11.2		30	6,658	-14.0	42
400----	31	7,613	-17.5	50	29	7,350	-26.6		11	7,578	-17.2		30	7,531	-20.3	40
350----	31	8,598	-24.4	49	29	8,299	-33.8		11	8,565	-24.1		30	8,506	-27.2	
300----	31	9,702	-32.7	46	29	9,361	-41.8		11	9,872	-32.3		30	9,598	-35.0	
250----	31	10,980	-42.5		28	10,581	-48.8		9	10,931	-42.5		30	10,843	-44.2	
200----	31	12,427	-54.5		26	12,027	-50.6		9	12,399	-54.6		29	12,302	-54.2	
175----	31	13,269	-60.8		25	12,892	-50.5		9	13,240	-60.6		29	13,148	-58.9	
150----	29	14,211	-86.6		25	13,895	-51.4		8	14,195	-66.8		29	14,103	-62.8	
125----	29	15,301	-70.4		25	15,076	-52.1		8	15,280	-71.8		29	15,219	-64.5	
100----	24	18,629	-89.5		24	16,512	-53.3		5	16,599	-71.2		26	18,585	-82.4	
80-----	20	17,968	-65.8		21	17,955	-52.8						24	17,971	-59.2	
60-----	18	19,737	-60.9		21	19,815	-51.7						23	19,783	-58.2	
50-----	18	20,877	-58.8		20	20,999	-50.7						23	20,945	-54.1	
40-----	13	22,279	-58.0		17	22,456	-49.7						20	22,386	-52.4	
30-----	7	24,101	-53.7		7	24,347	-48.1						17	24,252	-49.6	

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T., "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20 *Air Force Data for March 1954

Standard pressure surface (mb.)	DENVER, COLO. (828 MB.)				FT. WORTH, TEX. (993 MB.)				OGDEN, UTAH (851 MB.)				RANTOUL, ILL. (988 MB.)				ROME, N. Y. (993 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,661	1.4	51	28	178	14.3	46	31	1,450	2.4	58	31	227	1.0	72	31	146	- 1.3	73
1,000--	31	106			28	117	6.4		31	122			31	124			31	92	- 3.3	
950----	31	535			28	551	13.8	40	31	552			31	538	.9	67	31	502	- 2.1	70
900----	31	980			28	1,005	11.8	41	31	995			31	971	- 1.3	67	31	929	- 4.7	72
850----	31	1,446			28	1,481	9.4	37	31	1,459	2.5	52	31	1,426	- 2.4	61	31	1,378	- 7.2	70
800----	31	1,938	1.1	50	28	1,981	6.9	33	31	1,949	.5	53	31	1,905	- 4.4	56	31	1,848	- 9.2	65
750----	31	2,459	- 1.9	50	28	2,516	4.5	28	31	2,465	- 3.3	56	31	2,419	- 6.0	51	31	2,349	-10.7	56
700----	31	3,000	- 4.8	52	28	3,069	1.9	26	31	3,005	- 7.2	60	31	2,950	- 8.6	49	31	2,873	-12.4	51
650----	31	3,582	- 8.6	54	28	3,665	- 1.9	30	31	3,584	-11.0	58	31	3,527	-11.8	49	31	3,440	-15.2	53
600----	31	4,194	-13.1	56	28	4,294	- 6.1		31	4,188	-15.1	54	31	4,131	-15.0	48	31	4,034	-18.4	51
550----	31	4,854	-17.7	55	28	4,971	-10.7		31	4,844	-19.3	52	30	4,785	-19.2	45	31	4,680	-21.9	50
500----	31	5,557	-22.6	51	28	5,695	-15.6		30	5,539	-24.0	47	30	5,486	-23.8	44	31	5,373	-26.2	43
450----	31	6,325	-28.2	50	28	6,488	-21.1		30	6,305	-29.5		30	6,250	-29.5		30	6,128	-31.5	
400----	31	7,156	-34.4		28	7,343	-27.0		30	7,130	-35.4		30	7,077	-35.5		30	6,949	-37.4	
350----	31	8,076	-41.3		27	8,298	-33.5		29	8,037	-42.6		30	7,993	-41.7		28	7,867	-44.1	
300----	31	9,106	-47.9		27	9,363	-41.4		29	9,060	-49.7		30	9,023	-47.6		28	8,885	-50.5	
250----	31	10,292	-53.8		26	10,583	-50.3		29	10,235	-55.6		28	10,206	-52.4		28	10,061	-54.1	
200----	31	11,713	-55.7		26	12,009	-58.3		25	11,637	-55.3		25	11,642	-55.0		25	11,496	-54.9	
175----	31	12,564	-55.0		21	12,830	-59.5		25	12,491	-54.1		23	12,498	-54.5		24	12,349	-54.1	
150----	28	13,548	-56.1		14	13,827	-61.5		21	13,489	-55.1		18	13,485	-54.7		22	13,332	-53.9	
125----	26	14,705	-56.7		11	14,896	-62.8		14	14,641	-56.2		14	14,622	-55.3		20	14,479	-55.0	
100----	18	16,106	-59.1		6	16,228	-66.1		7	16,047	-59.2		7	16,063	-56.6		12	15,885	-57.5	
80-----	13	17,495	-59.7														5	17,297	-59.0	

* April data for the above Air Force stations will be included in the August issue of this publication.

Note: All observations scheduled at 0300, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Table 21

JULY 1954

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)			* Buffalo, N. Y. (182 m.)			Burlington, Vt. (100 m.)			Charleston, S. C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)			Ely, Nev. (1,910 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface----------	30	163	3.4	31	206	1.4	31	86	1.1	30	123	1.5	31	336	3.9	31	144	7.4	30	270	2.5	31	297	2.4	30	184	4.1	31	328	0.8	31	156	2.4	31	204	3.6
500--------------	--	---	----	--	---	----	--	---	----	--	---	----	--	---	----	31	151	8.5	30	280	3.9	31	286	3.1	30	185	3.9	31	332	1.4	--	---	----	--	---	----
1,000------------	30	159	4.2	--	---	----	--	---	----	30	137	1.9	31	336	3.2	30	155	6.8	30	277	4.8	31	285	4.4	29	231	2.0	31	315	1.9	--	---	----	--	---	----
1,500------------	30	150	3.7	--	---	----	31	73	1.2	30	176	2.1	31	337	1.1	28	154	4.9	30	279	6.2	30	284	6.1	28	292	1.8	30	298	2.9	31	143	2.9	--	---	----
2,000------------	29	151	3.6	31	237	1.1	30	138	.7	30	227	2.4	31	254	1.7	21	137	3.6	30	285	7.7	23	273	7.2	27	309	3.2	27	309	4.6	31	131	3.1	31	208	3.6
2,500------------	29	150	4.0	31	217	.9	30	232	2.1	29	255	5.3	31	233	4.6	19	111	3.8	30	291	9.0	22	284	8.6	27	322	4.1	26	313	6.1	31	122	3.2	31	213	4.0
3,000------------	29	143	3.4	31	165	1.0	30	250	4.6	27	261	8.0	31	235	6.9	17	116	3.5	30	294	10.4	19	290	8.6	25	320	4.1	24	319	7.7	30	113	3.5	30	208	4.4
4,000------------	27	104	2.4	29	182	1.2	28	259	10.0	24	275	10.1	29	234	11.4	14	108	3.2	29	301	13.3	13	291	10.9	20	336	3.1	18	323	9.7	29	106	4.2	29	214	4.5
5,000------------	21	89	2.9	28	216	.5	26	265	14.0	22	278	12.6	28	235	14.1	12	96	3.8	29	301	15.0	10	294	13.3	16	340	4.0	18	322	12.5	26	111	3.9	24	204	6.2
6,000------------	20	87	2.5	26	183	1.5	23	264	16.7	18	276	16.9	25	233	15.3				29	301	17.3	10	290	16.9	16	340	3.4	16	319	15.3	24	105	4.0	18	220	7.9
8,000------------				20	169	2.8	10	259	21.6	15	271	20.6	20	237	18.6				28	296	21.5				11	333	4.3	15	312	17.7	21	96	5.3	14	235	12.5
10,000-----------				12	153	1.4							16	239	25.9				27	296	29.2							13	326	21.2	18	100	5.0	13	238	14.6
12,000-----------																			27	298	29.5										16	96	5.9	11	240	15.8
14,000-----------																			27	295	22.6										13	99	5.9			
16,000-----------																			25	294	11.8															

Altitude (meters) m.s.l.	Grand Junction, Colo. (1,475 m.)			Green Bay, Wis. (210 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Little Rock, Ark. (88 m.)			Medford, Ore. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			Oakland Calif. (8 m.)			Omaha Nebr. (306 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface----------	31	257	3.1	31	197	0.1	31	291	0.9	31	251	1.9	30	123	2.7	31	169	2.6	31	307	2.0	31	139	2.6	30	181	2.4	31	271	1.2	31	281	4.9	28	116	1.7
500--------------	--	---	----	31	191	.2	31	282	1.3	--	---	----	29	144	2.4	31	175	3.1	31	309	2.4	31	159	3.3	29	193	2.7	31	276	2.4	31	279	4.3	28	128	2.4
1,000------------	--	---	----	30	251	1.7	31	274	1.6	31	226	1.9	29	173	1.7	31	185	2.0	31	313	2.8	30	171	2.3	26	197	1.3	31	288	2.6	30	269	3.1	27	146	2.8
1,500------------	31	255	3.1	30	281	4.4	31	294	2.6	31	238	2.6	27	239	1.6	30	249	.9	31	273	1.4	30	183	1.5	21	284	.7	31	287	2.6	30	249	2.8	26	193	2.6
2,000------------	31	268	2.5	26	297	6.7	28	304	3.2	30	246	3.9	25	269	1.6	30	296	2.0	31	217	3.8	30	203	1.2	14	334	1.2	29	282	2.6	30	231	2.9	24	244	3.4
2,500------------	31	259	1.6	24	304	8.6	25	305	4.7	28	240	5.4	25	305	1.3	28	324	1.3	31	212	6.4	29	207	1.7	12	31	1.5	27	293	3.6	30	218	3.5	23	262	5.4
3,000------------	31	257	2.1	24	309	10.5	23	311	5.7	26	249	7.8	24	344	.9	25	6	2.0	31	210	7.7	29	207	1.8	10	48	2.1	26	319	3.9	30	220	4.8	23	264	6.3
4,000------------	31	251	2.8	21	308	12.4	23	315	7.2	25	258	12.4	21	35	1.3	20	345	1.7	31	234	11.9	21	202	2.3				23	326	5.3	30	216	6.1	23	278	7.2
5,000------------	30	240	4.2	16	316	16.3	19	321	9.3	20	260	15.3	18	32	2.8	17	1	2.2	30	231	14.3	18	219	2.7				19	330	7.0	29	221	7.3	19	296	6.6
6,000------------	25	234	4.0	14	310	18.1	17	314	10.3	18	262	18.2	17	27	2.8	14	354	2.5	29	232	15.8	16	28	1.1				19	337	6.6	29	216	7.3	16	293	8.5
8,000------------	19	246	4.4				11	309	11.6	15	262	25.2	15	360	2.7				29	237	18.0	12	64	4.5				15	321	5.7	22	224	10.4	12	296	11.7
10,000-----------	14	262	6.6				10	310	11.9				10	277	2.8				17	240	22.3										13	221	13.3			
12,000-----------	11	263	9.4																																	
14,000-----------	10	263	5.4																																	

Altitude (meters) m.s.l.	Phoenix, Ariz. (345 m.)			Rapid City, S. Dak. (982.m.)			St. Cloud, Minn. (318 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			** Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (725 m.)			# Washington, D. C. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface----------	31	277	2.7	31	97	1.8	30	204	0.3	30	163	3.6	29	262	2.9	30	291	3.9	31	213	3.0	31	263	1.7
500--------------	31	265	3.2	--	---	----	30	181	.7	30	161	4.3	27	276	2.6	30	306	5.9	--	---	----	31	264	3.0
1,000------------	31	259	3.2	31	104	1.8	28	211	1.6	30	154	4.3	26	301	1.9	30	305	6.9	31	216	3.7	31	272	3.6
1,500------------	31	262	2.2	31	140	2.2	27	262	2.8	30	146	4.2	25	285	.3	30	306	6.2	31	217	4.3	31	278	4.5
2,000------------	31	258	1.4	31	175	2.2	23	283	4.4	30	144	3.8	25	151	1.3	30	311	6.7	29	220	5.0	31	289	5.6
2,500------------	31	261	.1	31	211	2.9	22	288	6.8	28	147	4.1	25	155	2.4	30	311	8.1	28	222	6.6	30	292	6.8
3,000------------	29	106	.8	31	250	4.5	20	291	8.4	27	130	3.6	24	162	3.0	30	312	10.2	27	228	9.0	30	299	7.8
4,000------------	28	113	2.8	29	277	7.8	16	302	11.4	25	114	2.8	24	173	3.9	30	308	13.5	26	234	13.8	30	297	9.7
5,000------------	25	133	3.7	26	274	9.7	12	306	13.6	17	105	3.7	22	172	4.7	30	311	16.1	22	239	16.8	30	296	13.1
6,000------------	22	131	5.2	23	271	12.4	10	304	14.8	14	112	4.4	21	148	4.2	29	310	20.4	21	241	19.5	30	301	15.8
8,000------------	14	135	5.2	17	264	17.0							18	155	4.2	29	310	26.3	16	242	24.5	30	296	18.1
10,000-----------	11	163	4.4										16	169	5.6	27	311	30.6				30	298	20.8
12,000-----------													14	193	6.1	26	309	35.6				30	294	22.3
14,000-----------																25	311	27.3				30	285	20.0
16,000-----------																20	313	14.7				30	291	12.2

* Rawin Data (Cont'd.)
18,000 m., 24 obs. 316 dir., 2.8 speed

** Rawin Data (Cont'd.)
18,000 m., 18 obs. 335 dir., 5.8 speed
20,000 m., 15 obs. 50 dir., 3.1 speed
22,000 m., 15 obs. 97 dir., 3.8 speed

Rawin Data (Cont'd.
18,000 m., 30 obs. 325 dir., 2.7 speed
20,000 m., 28 obs. 105 dir., 3.3 speed
22,000 m., 26 obs. 88 dir., 6.3 speed
24,000 m., 21 obs. 87 dir., 9.7 speed
26,000 m., 14 obs. 86 dir., 12.9 speed

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

RAWIN DATA

Average monthly resultant winds

Table 22

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Buffalo, N. Y. (182 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S. C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N. C. (275 m.)			Hatteras, N. C. (3 m.)			Int. Falls, Minn. (358 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	358	0.8	31	94	3.1	31	134	4.7	31	250	0.9	31	229	0.9	31	242	2.6	31	194	2.0	31	106	1.9	31	143	1.2	31	177	0.5	31	189	2.1	31	215	0.4
500	--	---	----	--	---	----	31	147	9.3	30	297	3.7	31	191	1.1	31	257	5.3	29	204	6.1	31	130	3.6	--	---	----	31	216	1.9	29	224	3.7	31	240	1.0
1,000	--	---	----	30	140	3.1	31	147	8.3	30	297	5.9	31	132	.7	31	276	5.6	29	219	3.7	31	166	3.7	--	---	----	31	249	2.1	29	256	3.1	31	266	2.6
1,500	--	---	----	30	203	3.3	31	141	6.9	30	294	6.5	31	85	1.4	31	274	4.9	31	286	2.2	31	222	2.9	31	144	1.3	31	288	3.0	29	281	4.1	31	300	3.5
2,000	31	319	.7	30	250	4.8	31	136	5.5	31	297	8.0	31	78	2.0	31	272	5.2	31	324	3.2	31	248	3.7	31	178	2.8	31	299	4.1	29	288	5.1	31	307	4.6
2,500	31	171	1.1	31	266	5.9	30	132	5.4	31	297	8.7	31	71	2.1	31	272	5.7	31	349	3.2	31	272	4.4	31	173	1.8	31	309	4.4	30	278	4.7	31	306	7.0
3,000	31	152	1.8	31	280	7.5	30	123	5.2	31	298	10.1	31	63	2.4	31	273	6.8	31	353	2.9	31	290	5.2	31	220	1.0	31	309	5.4	30	287	4.9	31	308	8.9
4,000	31	171	2.0	30	283	10.6	29	117	4.8	31	304	13.4	31	72	2.0	30	262	7.4	31	352	2.8	31	311	6.5	31	279	1.9	31	312	5.7	30	292	5.4	31	302	13.5
5,000	31	174	1.0	30	283	13.1	28	109	3.9	31	305	14.8	31	81	2.4	28	268	8.1	30	2	3.6	31	318	6.6	31	258	3.2	30	312	6.6	29	303	5.2	31	301	15.6
6,000	31	120	1.2	30	286	15.6	28	114	3.8	29	304	16.7	31	76	2.4	27	274	9.1	29	354	3.9	31	326	6.8	31	245	4.8	30	315	7.8	29	307	6.2	29	299	18.3
8,000	30	164	1.8	27	282	20.5	28	91	3.4	29	303	22.1	31	69	3.8	25	272	11.9	26	345	4.7	31	313	9.2	30	239	8.3	28	311	11.7	28	305	10.7	21	302	23.2
10,000	30	116	1.0	21	278	24.3	28	57	1.8	28	303	27.2	28	62	4.3	22	277	11.7	26	328	6.1	31	306	10.4	29	235	11.0	24	304	11.2	27	305	13.3	15	292	28.4
12,000	29	45	.3	16	277	23.7	28	125	4.4	28	302	30.7	28	63	4.4	21	273	13.3	26	309	9.1	31	302	12.3	27	235	13.1	16	288	12.9	23	305	14.4			
14,000	28	108	1.9	13	280	21.1	27	87	4.8	25	302	21.4	28	58	6.9	21	274	11.4	24	311	8.7	30	309	12.0	20	219	8.3	14	302	13.3	21	304	11.4			
16,000	20	120	3.6	12	297	7.6	22	66	6.5	11	307	13.3	23	62	6.3	20	276	6.6	20	5	4.9	27	329	7.1	14	237	4.9				18	343	5.7			
18,000	14	102	4.6	10	352	3.2	18	86	12.5				18	90	7.6	17	254	2.7	19	91	5.1	23	30	2.8	11	71	1.3				12	67	6.1			
20,000	13	77	9.4				14	85	18.8				15	68	10.4	15	97	3.3	19	79	9.7	22	74	6.5	10	84	3.8									
22,000	11	87	12.6													14	87	4.5	16	84	14.3	20	83	9.0												
24,000																			13	95	15.9	13	79	10.7												

Altitude (meters) m.s.l.	Little Rock, Ark. (80 m.)			Medford, Ore. (401 m.)			Miami, Fla. (12 m.)			Midland, Tex. (871 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma, City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			St. Cloud, Minn. (318 m.)			San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	166	1.9	31	330	4.4	31	141	1.6	31	138	3.0	31	218	2.6	31	193	0.5	31	275	4.0	31	152	4.1	31	99	2.0	31	90	0.4	31	156	4.1	31	100	4.1
500	31	183	4.7	31	328	5.1	31	151	3.3	--	---	----	31	257	5.9	29	211	.7	31	282	5.4	31	157	5.7	--	---	----	31	74	1.4	31	152	7.4	31	92	9.3
1,000	31	198	4.4	31	321	5.1	31	155	3.4	31	147	5.2	31	269	6.1	29	232	1.7	31	277	5.0	30	174	8.1	31	100	2.3	31	208	.8	31	156	7.3	31	96	9.7
1,500	31	199	2.4	29	293	3.3	31	157	4.0	31	151	8.4	31	275	6.6	29	254	2.2	31	252	4.4	30	182	6.5	31	142	4.8	31	265	2.5	31	153	5.5	31	96	9.4
2,000	31	148	.6	29	247	3.6	31	156	3.4	31	149	7.1	31	272	7.6	29	261	2.5	31	239	3.8	30	192	4.9	31	167	4.5	31	276	4.2	31	139	4.2	31	93	9.1
2,500	30	11	.7	29	220	6.1	31	157	3.5	31	137	5.5	30	275	8.4	28	290	2.9	31	234	3.5	30	205	2.4	31	189	4.0	31	289	6.5	31	125	4.9	31	96	9.5
3,000	30	24	1.8	30	219	8.3	30	161	2.5	30	127	5.7	30	267	9.5	28	322	3.2	31	226	4.1	30	179	.4	31	224	4.1	31	293	8.0	31	116	4.3	31	98	9.9
4,000	28	28	4.0	29	228	11.6	30	150	1.5	30	100	4.9	28	262	11.5	30	346	4.0	31	221	5.6	30	58	2.6	31	261	7.0	31	296	10.9	31	90	4.4	31	97	9.3
5,000	26	36	4.4	29	236	14.3	30	87	1.3	30	79	5.4	28	265	13.0	31	350	6.5	31	230	6.9	31	60	3.5	30	281	8.8	31	301	13.6	31	83	5.5	31	94	7.4
6,000	25	30	4.3	28	235	15.7	30	60	2.1	31	71	6.2	26	270	14.0	31	352	6.7	31	226	7.6	31	39	2.8	30	283	11.0	31	300	15.7	31	71	4.9	31	99	5.1
8,000	23	355	2.6	25	236	19.7	30	64	3.6	30	64	7.2	23	273	18.8	31	340	8.5	31	230	11.2	29	27	3.5	30	272	15.2	27	296	18.6	30	84	5.6	30	115	3.2
10,000	20	341	1.4	17	240	21.4	30	55	6.8	29	60	7.1	17	279	21.9	28	332	6.8	28	228	16.5	29	24	3.9	29	271	19.7	25	289	25.3	30	89	5.8	30	210	2.6
12,000	16	340	3.6	11	240	24.1	30	57	8.3	25	70	6.5				28	325	8.9	22	229	18.5	29	34	3.0	25	262	20.9	21	289	26.6	29	82	7.0	30	237	4.1
14,000	13	321	3.8				29	52	8.8	24	65	8.0				28	315	11.3				29	11	3.4	22	267	17.6	18	293	21.8	25	93	6.3	29	218	1.7
16,000							26	80	6.7	18	74	7.5				25	354	7.9				27	20	3.8	16	292	9.7	18	299	12.3	21	94	6.8	29	105	7.6
18,000							23	95	10.3	14	77	7.5				19	63	4.2				24	89	4.9				16	300	4.2	14	88	8.7	23	88	12.8
20,000							21	84	14.6	12	84	10.7				19	69	6.8				21	78	9.8				17	75	1.8	13	85	11.2	22	87	19.9
22,000							16	85	17.1							17	77	11.8				14	88	11.6				12	76	6.5	13	85	15.0	20	88	22.8
24,000																14	92	16.0																12	90	26.7

Altitude (meters) m.s.l.	Santa Maria, Calif. (72 m.)			Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is., Wash. (33 m.)			Washington, D. C. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	264	3.6	30	283	1.7	31	233	1.6	31	242	2.9	31	227	1.0
500	31	317	3.2	30	311	3.5	--	---	----	31	259	4.1	31	276	3.5
1,000	31	324	3.2	30	318	4.7	31	227	2.8	30	254	3.7	31	301	4.5
1,500	31	33	2.0	30	307	5.6	31	230	3.8	29	242	2.3	31	299	4.9
2,000	31	69	2.4	30	315	6.3	31	235	4.7	29	232	2.5	31	300	5.4
2,500	31	101	2.1	30	316	7.6	31	236	7.0	29	240	3.5	31	298	6.0
3,000	31	170	1.0	30	311	8.8	31	234	9.2	29	243	4.3	31	301	6.3
4,000	31	217	1.9	30	312	11.9	31	234	14.5	27	246	6.2	29	300	8.0
5,000	31	215	3.5	30	312	14.9	31	239	17.1	24	249	9.2	29	299	11.2
6,000	31	209	5.0	30	310	18.5	30	238	19.1	21	256	12.2	29	299	14.6
8,000	31	217	6.5	30	314	23.2	29	238	23.7	18	253	17.0	29	293	18.4
10,000	31	209	8.2	29	313	31.1	29	235	30.0	15	257	21.7	29	292	22.4
12,000	31	210	11.7	22	308	33.2	26	240	30.7	11	244	22.1	28	291	23.9
14,000	30	212	9.8	16	320	22.8	25	244	24.3				28	296	23.2
16,000	29	197	6.4	13	323	14.6	24	247	11.4				28	304	11.6
18,000	29	114	3.0				25	227	3.6				23	335	1.9
20,000	27	84	8.5				23	115	3.4				22	75	4.8
22,000	25	93	12.1				20	85	5.7				19	85	9.1
24,000	13	91	14.0				16	94	8.4				17	91	13.0
26,000													10	91	13.4

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following Table 22 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

RAWIN DATA

Average monthly resultant winds

Table 22 *Air Force Data for March 1954

Altitude (meters) m.s.l.	Denver, Colo. (1,661 m.)			Ft. Worth, Tex. (178 m.)			Ogden, Utah (1,450 m.)			Rantoul, Ill. (227 m.)			Rome, N. Y. (146 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	321	0.4	31	145	0.4	30	55	0.6	31	331	1.7	30	293	2.1
500	--	---	----	31	178	3.3	--	---	----	29	291	3.0	29	263	6.4
1,000	--	---	----	31	212	5.3	--	---	----	29	267	3.8	29	273	9.9
1,500	--	---	----	31	241	6.9	30	62	.7	29	278	7.1	30	277	12.3
2,000	30	292	1.4	31	254	8.5	30	241	2.3	30	278	10.5	30	280	13.5
2,500	30	302	2.8	31	266	11.1	30	254	4.6	30	277	12.7	30	278	14.3
3,000	30	284	5.9	31	270	13.0	30	266	7.1	30	278	13.1	29	277	14.7
4,000	30	285	11.3	31	272	17.2	30	264	9.0	31	273	15.8	29	278	18.8
5,000	31	286	13.2	30	269	21.1	29	274	12.7	30	283	19.4	29	275	23.0
6,000	31	289	15.9	30	269	25.7	29	281	15.0	30	279	21.4	28	272	24.9
8,000	31	287	21.9	29	266	33.2	29	277	20.0	30	277	29.5	23	277	33.1
10,000	31	278	34.4	28	263	43.3	26	271	26.7	28	273	38.7	19	274	32.4
12,000	27	278	32.8	28	269	43.0	21	275	28.0	22	272	34.8	15	278	33.3
14,000	24	266	25.4	14	269	40.5	16	267	24.1	16	270	25.1	12	274	22.8
16,000	15	272	20.7												

* April data for the above Air Force stations will be included in the August issue of this publication.

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following Table 22 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun. JULY 1954

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
LINCOLN, NEBR.									
	Air mass								
	4.77	3.81	2.86	1.91	•0.95	1.91	2.86	3.81	4.77
July									
2	----	----	----	----	1.16	0.82	0.62	0.50	0.41
7	----	----	----	----	1.22	1.06	.90	.79	.69
8	----	----	----	----	1.25	.97	.77	.64	.52
12	----	----	----	----	1.12	.88	.69	.56	.45
13	----	----	----	----	1.22	----	----	----	----
28	----	----	----	----	1.19	.92	.82	.60	.50
29	----	----	----	----	1.21	----	----	----	----
Averages	----	----	----	----	1.20	.93	.76	.62	.51
Departures	----	----	----	----	-.12	-.13	-.13	-.14	-.14
BLUE HILL, MASS.									
	Air mass								
	4.86	3.89	2.92	1.94	•0.97	1.94	2.92	3.89	4.86
July									
2	----	----	----	----	----	----	1.00	0.88	0.80
3	.63	.73	.88	1.07	----	----	----	----	----
6	.65	.73	.88	----	----	1.12	.95	.85	.73
9	----	----	----	1.10	----	----	.80	.70	.60
10	.65	.76	.89	1.08	----	----	----	----	----
11	----	----	.88	1.08	----	----	----	----	----
12	.61	.70	.85	1.03	----	----	----	----	----
14	----	----	----	----	----	----	.98	.88	.78
17	.75	.87	1.00	1.20	----	----	----	----	----
22	.80	.90	1.00	1.14	----	----	----	----	----
23	.72	.82	.94	1.12	----	----	----	----	----
Averages	.69	.79	.92	1.10	----	(1.12)	.93	.83	.73
Departures	.03	.05	.04	.06	----	.08	.07	.10	.08

• Extrapolated

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
ALBOQUERQUE, N. MEX.									
	Air mass								
	4.08	3.26	2.44	1.63	•1.0	1.63	2.44	3.26	4.08
July									
1	0.71	0.78	0.94	1.03	1.26	----	----	0.89	0.80
4	.78	.86	.99	1.14	1.33	1.20	----	----	----
5	.74	.81	.95	1.11	1.32	----	----	----	----
6	.76	.87	1.00	1.15	1.36	1.18	----	.92	----
10	.76	.85	.96	1.12	1.33	1.14	1.00	.87	.80
11	----	----	----	.93	1.27	----	----	----	----
12	----	----	.98	1.11	1.35	1.14	.99	.88	.78
13	.76	.86	.99	----	----	1.17	1.02	.89	.80
15	.29	.44	.69	.99	----	----	----	----	----
17	.66	.77	----	----	----	1.14	----	----	----
18	----	----	.88	----	----	----	----	----	----
19	.78	.89	1.02	----	----	----	----	----	----
20	----	----	----	----	----	1.15	----	----	----
24	----	----	----	1.28	----	----	----	----	----
25	.82	.93	1.05	1.20	1.39	1.27	1.14	1.01	.88
26	----	----	----	----	----	----	.87	----	----
27	.77	.85	1.16	1.37	----	----	----	----	----
28	.83	.91	1.03	1.17	1.35	----	----	.90	.82
29	.60	.69	.84	1.04	1.29	----	----	----	----
30	.69	.77	.91	1.08	1.31	----	----	----	----
31	.75	.84	.97	1.14	1.37	----	----	----	----
Averages	.71	.75	.95	1.09	1.33	1.06	1.00	.91	.83
Departures	-.02	-.06	.00	-.02	-.05	-.14	.01	.05	.02
TABLE MOUNTAIN, CALIF.									
	Air mass								
	3.76	3.01	2.26	1.51	•0.75	1.51	2.26	3.01	3.76
July									
1	----	----	----	1.38	----	----	----	----	----
6	1.00	1.09	1.20	1.33	----	----	----	----	----
10	----	----	----	1.39	----	----	----	----	----
11	----	----	----	1.31	----	----	----	----	----
31	----	----	----	1.27	----	----	----	----	----
Averages	(1.00)	(1.09)	(1.20)	1.34	----	----	----	----	----
Departures	(-.12)	(-.11)	(-.10)	-.06	----	----	----	----	----

Langley is the unit used to denote one gram calorie per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

Table 31a Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing nortb at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	2	3	4	5	6	7	8		9	10	11	12	13	14	15		16	17	18	19	20	21	22	
Langleys	185	190	208	169	219	165	198	191	178	195	189	203	199	187	156	186	185	201	162	157	170	106	137	160
Date	23	24	25	26	27	28	29		30	31	1	2	3	4	5									
Langleys	129	141	120	154	127	90	149	130	132	136	134	129	23	134	102	113								

Table 31b Daily totale and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	2	3	4	5	6	7	8		9	10	11	12	13	14	15		16	17	18	19	20	21	22	
Langleys	271	297	288	449	421	218	304	321	382	458	421	437	267	430	207	372	408	454	223	120	336	101	444	298
Date	23	24	25	26	27	28	29		30	31	1	2	3	4	5									
Langleys	434	409	132	274	374	171	---	(299)	---	---	---	168	53	403	---	---								

Table 31c Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	2	3	4	5	6	7	8		9	10	11	12	13	14	15		16	17	18	19	20	21	22	
Langleys	265	256	239	251	242	192	263	244	256	251	227	264	256	250	235	249	244	238	215	129	258	111	259	208
Date	23	24	25	26	27	28	29		30	31	1	2	3	4	5									
Langleys	222	234	127	224	265	115	177	195	232	276	188	232	35	268	218	207								

Table 31d Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during tbe month

								Avg								Avg								Avg
Date	2	3	4	5	6	7	8		9	10	11	12	13	14	15		16	17	18	19	20	21	22	
Langleys	446	436	545	298	524	240	343	405	468	290	445	398	452	468	364	412	403	492	208	336	439	150	350	340
Date	23	24	25	26	27	28	29		30	31	1	2	3	4	5									
Langleys	290	257	179	286	272	132	277	242	411	374	411	364	52	334	---	324								

Table 31e Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	2	3	4	5	6	7	8		9	10	11	12	13	14	15		16	17	18	19	20	21	22	
Langleys	197	234	300	173	208	271	314	242	129	211	197	185	289	128	227	195	186	150	289	202	162	154	140	183
Date	23	24	25	26	27	28	29		30	31	1	2	3	4	5									
Langleys	109	196	238	263	190	185	283	209	242	183	214	259	39	263	245	206								

Note: Langley is the unit used to denote one gram calorie per square centimeter.

SOLAR RADIATION DATA

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys. JULY 1954

1954	Albrook Air Base Panama, C. Z.	Aklavik, Mackenzie	Albuquerque, N. Mex.	Annette, Alaska	Astoria, Oregon	Atlanta, Ga.	Barrow, Alaska	Bethel, Alaska	Bismark, N. Dak.	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Tex.	Canton Island, Pacific Area	Caribou, Me.	Charleston, S. C.	Columbia, Mo.	Davis, Calif.	Dodge City, Kans.	East Lansing, Mich.	East Wareham, Mass.	El Paso, Texas	Ely, Nev.	Fairbanks, Alaska	Ft. Worth, Texas	Fresno, Calif.	Grand Junction, Colo.	Great Falls, Mont.	Greensboro, N. C.	Griffin, Ga.	Hatteras, N. C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.	Lake Charles, La.	Lander, Wyo.	Las Vegas, Nev.
July 2	346	604	765	492	687	555	632	422	327	600	749	571	259	620	(181)	670	709	750	757	472	422	768	809	743	623	755	784	641	675	543	755	654	885	672	490	894	770
July 3	388	634	763	310	748	656	416	507	472	569	720	608	---	590	220	687	743	760	570	113	366	765	823	774	488	741	464	820	533	697	784	571	839	452	476	894	731
July 4	458	493	776	582	706	710	303	606	753	540	729	580	611	594	789	293	679	749	599	362	479	772	425	642	484	699	695	784	535	734	527	659	853	742	631	826	421
July 5	428	640	718	561	640	717	411	734	730	659	715	609	612	613	---	627	734	761	426	518	610	757	813	692	774	774	710	488	652	775	732	670	867	485	---	648	781
July 6	347	603	795	447	260	---	195	614	696	654	724	621	---	624	614	652	755	704	695	424	636	(527)	(811)	441	740	717	808	771	782	797	712	709	856	701	---	812	785
July 7	235	499	578	598	374	---	442	418	687	390	722	394	652	---	266	644	660	716	723	326	378	648	803	599	684	775	646	647	758	766	773	199	843	195	---	619	768
July 8	273	(625)	624	196	476	---	533	447	733	537	684	415	541	420	551	464	803	750	763	482	381	637	(797)	665	489	771	692	(575)	503	622	500	743	862	703	---	614	771
Averages	354	(586)	717	455	556	660	419	535	615	564	720	542	535	577	(437)	577	726	741	648	385	467	(696)	(755)	651	612	747	685	(675)	634	705	683	601	858	564	---	758	718
Departures	---	---	---	---	---	---	---	---	---	-16	---	---	---	---	---	---	---	23	---	-101	-105	---	---	169	---	28	---	---	---	---	---	---	---	-2	---	---	---
July 9	153	680	742	376	210	497	476	295	660	703	616	623	594	561	507	508	762	722	610	585	550	765	(793)	437	744	777	811	612	390	607	427	588	861	714	733	558	776
July 10	349	458	781	669	266	466	---	311	553	611	704	527	709	588	559	201	272	731	738	122	601	658	794	204	812	761	785	550	594	510	392	682	873	555	722	866	765
July 11	423	267	687	337	487	634	413	610	713	608	685	681	677	540	672	612	655	720	746	207	509	776	638	259	818	755	743	771	714	730	133	615	845	687	703	683	511
July 12	566	301	721	426	731	682	410	672	463	670	687	620	683	---	731	825	744	723	758	543	662	724	738	(721)	781	738	791	742	766	744	467	659	821	537	666	519	644
July 13	461	437	789	(658)	700	647	549	662	664	552	541	484	662	558	393	713	739	720	755	519	523	771	476	732	777	634	711	769	740	684	794	583	588	676	573	---	724
July 14	---	691	754	(658)	229	536	415	199	735	681	259	655	259	578	467	(757)	736	700	728	461	629	695	766	654	568	601	569	397	642	553	(772)	671	743	527	526	382	645
July 15	- -	582	704	239	160	668	208	350	310	504	356	452	392	---	448	694	634	730	700	642	340	559	721	532	801	718	664	521	438	482	476	734	822	705	---	839	751
Averages	391	495	739	(481)	398	590	412	443	586	619	550	577	568	565	540	(616)	649	721	719	440	545	705	(704)	(506)	757	712	725	623	612	616	(494)	647	793	629	654	641	688
Departures	---	---	---	---	---	---	---	---	---	100	---	---	---	---	---	---	---	39	---	-16	50	---	---	-2	---	7	---	---	---	---	---	---	---	89	---	---	---
July 16	508	608	700	109	359	403	553	399	627	623	610	500	667	541	461	423	537	745	747	627	513	603	685	613	791	714	635	638	724	285	115	699	669	562	---	723	545
July 17	429	681	744	213	456	402	619	387	450	687	727	633	679	540	723	268	638	722	742	518	677	564	475	439	(694)	679	429	745	764	534	775	673	694	710	301	683	333
July 18	252	(677)	715	162	301	550	525	297	636	430	401	439	700	527	497	---	719	742	365	479	535	719	380	568	770	712	658	765	415	623	808	599	718	488	589	651	493
July 19	378	(392)	674	417	315	562	412	348	426	279	539	304	687	589	86	637	696	743	650	605	219	622	508	680	772	740	526	---	498	695	500	651	764	605	261	631	662
July 20	463	140	774	307	226	671	---	364	611	637	682	519	667	520	470	433	643	726	513	256	599	647	---	137	795	758	776	622	596	741	751	508	334	405	650	---	727
July 21	611	366	708	109	553	621	339	181	664	181	719	144	670	549	288	620	525	695	699	515	127	702	(704)	247	792	762	690	257	449	713	415	142	824	383	703	---	706
July 22	349	453	598	(363)	693	487	514	173	624	618	735	514	568	455	200	635	676	728	445	642	625	704	(785)	288	796	712	540	766	370	550	---	615	820	747	656	---	711
Averages	427	(474)	702	(240)	415	528	494	307	577	493	630	436	663	532	389	503	633	729	595	520	471	652	(590)	424	(773)	725	608	632	545	591	560	555	760	557	527	672	597
Departures	---	---	---	---	---	---	---	---	---	0	---	---	---	---	---	---	---	42	---	84	-2	---	---	-9	---	29	---	---	---	---	---	---	---	43	---	---	---
July 23	281	508	637	430	664	545	580	304	746	524	716	469	684	538	231	576	491	667	125	369	556	563	(775)	388	749	(696)	787	(777)	693	523	726	617	775	739	688	---	694
July 24	231	663	---	437	603	613	544	160	722	492	695	501	661	527	378	392	433	661	638	620	505	751	627	445	767	(582)	537	686	656	626	745	638	578	715	688	---	406
July 25	132	650	790	202	608	566	221	289	673	245	601	260	628	---	294	600	725	569	702	632	384	---	346	586	542	640	513	745	645	374	586	621	690	566	313	---	418
July 26	520	436	756	467	403	607	270	216	643	351	637	495	627	540	475	628	729	651	529	568	560	748	390	116	728	666	681	(683)	608	538	725	498	766	674	489	---	631
July 27	291	458	730	337	677	652	193	190	(651)	492	682	512	644	---	331	606	747	684	675	568	596	723	(630)	360	755	(686)	761	730	739	682	755	679	782	612	637	---	717
July 28	349	415	781	394	695	634	165	126	532	198	688	165	651	622	685	748	537	681	696	298	428	685	627	104	741	(680)	785	754	696	683	776	662	742	398	---	---	722
July 29	331	238	686	312	585	594	285	136	630	290	695	294	470	479	662	748	727	693	719	305	589	677	623	303	807	680	739	(726)	705	716	734	538	807	311	325	596	716
Averages	305	(481)	730	368	605	602	322	203	(657)	370	674	385	623	541	437	614	623	658	583	480	517	691	(574)	329	727	(661)	686	(729)	677	592	721	608	734	573	523	---	615
Departures	---	---	---	---	---	---	---	---	---	-109	---	---	---	---	---	---	---	-7	---	5	26	---	---	-76	---	-15	---	---	---	---	---	---	---	67	---	---	---
July 30	393	(461)	769	131	503	544	355	141	168	395	732	401	604	509	77	---	723	676	701	495	511	726	(734)	152	307	676	759	745	662	543	714	636	798	608	437	744	709
July 31	371	441	693	431	433	550	176	157	686	556	688	579	670	541	438	554	559	671	613	197	591	594	(719)	259	448	672	747	733	634	560	751	467	792	400	603	705	713
Aug. 1	227	(469)	---	400	251	585	326	228	644	370	689	414	651	544	359	565	319	654	698	459	308	667	---	260	631	532	614	721	490	537	659	352	709	369	591	754	644
Aug. 2	494	(331)	758	321	355	618	223	171	618	407	669	454	673	410	681	487	731	670	721	365	408	690	615	422	548	572	790	594	625	724	704	211	425	564	678	738	486
Aug. 3	395	252	723	527	436	569	272	(365)	386	39	690	63	636	552	594	(647)	555	676	687	492	93	606	---	---	781	704	462	629	672	601	534	641	737	194	615	302	349
Aug. 4	357	320	641	584	339	670	240	254	521	451	507	491	629	603	54	681	724	688	710	435	498	628	(694)	462	774	719	412	604	531	---	651	392	838	370	700	484	691
Aug. 5	450	(414)	632	415	341	630	349	193	287	412	587	446	602	639	278	661	429	669	675	461	522	609	758	507	773	716	371	100	608	---	643	275	830	461	688	619	741
Averages	384	(384)	703	401	380	595	277	(215)	473	376	652	407	639	543	354	(599)	577	672	686	415	419	646	(704)	344	609	656	593	590	603	593	665	425	733	424	616	706	619
Departures	---	---	---	---	---	---	---	---	---	-101	---	---	---	---	---	---	---	19	---	-8	-44	---	---	-15	---	-18	---	---	---	---	---	---	---	-79	---	---	---

Accumulated Departures January 1 to August 5, 1954

	Albrook Air Base Panama, C. Z.	Aklavik, Mackenzie	Albuquerque, N. Mex.	Annette, Alaska	Astoria, Oregon	Atlanta, Ga.	Barrow, Alaska	Bethel, Alaska	Bismark, N. Dak.	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Tex.	Canton Island, Pacific Area	Caribou, Me.	Charleston, S. C.	Columbia, Mo.	Davis, Calif.	Dodge City, Kans.	East Lansing, Mich.	East Wareham, Mass.	El Paso, Texas	Ely, Nev.	Fairbanks, Alaska	Ft. Worth, Texas	Fresno, Calif.	Grand Junction, Colo.	Great Falls, Mont.	Greensboro, N. C.	Griffin, Ga.	Hatteras, N. C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.	Lake Charles, La.	Lander, Wyo.	Las Vegas, Nev.
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Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

SOLAR RADIATION DATA

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.-Continued

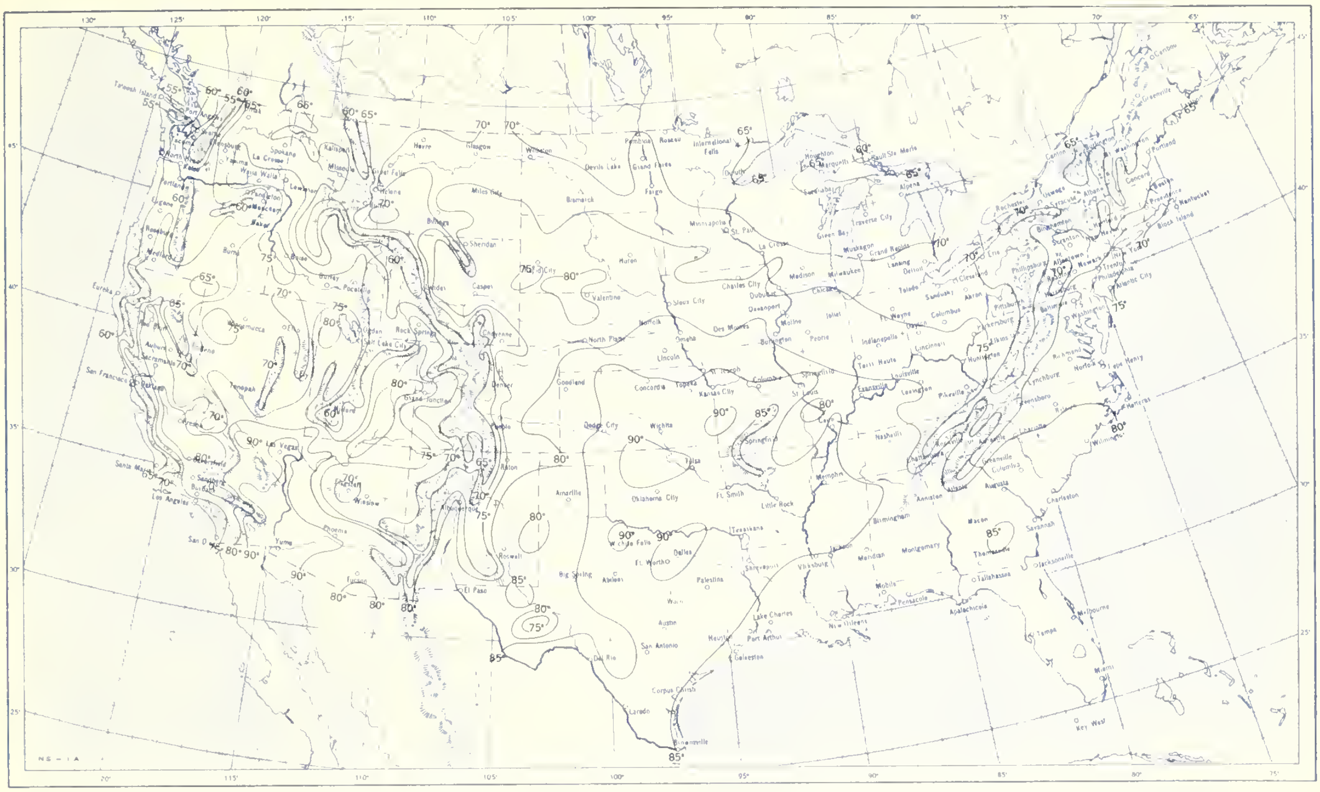
JULY 1954

	Lincoln, Nebr.	Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBCO)	Madison, Wisc.	Medford, Ore.	Miami, Fla.	Midland, Texas	Nashville, Tenn.	Newport, R. I.	New York, N. Y.	Oak Ridge, Tenn.	Oklahoma City, Okla	Ottawa, Ontario	Phoenix, Ariz.	Prosser 4 NE, Wash.	Rapid City, S. Dak.	Riverside, Calif.	St. Cloud, Minn.	San Antonio, Texas	Santa Maria, Calif.	S. Ste. Marie, Mich.	Sayville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle, Wash. (U. of W.)	Seattle, Wash. (WBAS)	State College, Pa.	Stillwater, Okla.	Swan Island, W. I.	Tampa, Fla.	Toronto, Canada	Upton, N. Y.	Wake Island, Pacific Area	Washington, D. C. (Silver Hill Obs.)	Winnipeg, Manitoba
1954																																				
July 2------	664	659	661	705	151	834	693	799	623	536	763	554	740	(418)	653	833	440	768	108	659	788	685	715	592	679	441	649	693	683	669	624	537	694	---	766	621
July 3------	317	657	656	671	261	831	723	785	539	263	428	588	738	774	657	820	738	494	360	435	783	690	419	604	421	351	763	372	630	536	551	683	392	701	492	476
July 4------	696	614	595	673	233	826	692	777	508	429	163	557	758	784	760	802	602	745	607	661	715	181	188	608	167	277	798	213	727	103	715	728	705	723	602	589
July 5------	614	691	711	751	724	823	583	712	663	---	422	586	767	(329)	764	761	724	780	740	762	697	724	546	339	313	381	723	368	725	593	628	410	558	688	454	678
July 6------	585	704	734	736	390	474	591	782	744	762	796	---	772	539	749	689	679	761	434	757	768	544	771	610	681	368	597	720	689	685	397	528	774	649	704	556
July 7------	683	720	718	686	623	764	180	791	687	294	151	---	656	685	755	659	762	744	624	771	779	799	194	471	239	302	283	108	551	669	339	555	---	620	464	776
July 8------	695	528	723	714	470	740	340	704	611	592	609	472	691	(573)	733	494	591	759	721	760	724	743	633	627	---	228	690	701	688	695	215	541	613	528	330	734
Averages------	603	653	685	705	407	756	543	764	625	479	476	551	732	(586)	724	723	648	722	514	687	751	624	495	550	417	335	643	454	670	583	496	569	623	651	545	633
Departures----	---	---	---	---	-144	---	---	---	---	-97	-38	---	---	---	---	---	---	92	---	---	---	---	---	---	---	---	---	-64	---	---	---	---	---	---	---	---
July 9------	719	695	704	702	510	663	404	767	728	757	722	557	734	(735)	610	474	631	754	203	768	786	756	764	632	---	482	248	775	579	---	200	643	766	703	475	324
July 10------	546	720	682	683	292	658	252	793	689	637	704	629	764	(773)	749	449	653	752	409	768	745	713	720	608	---	148	218	469	712	---	341	603	698	635	562	489
July 11------	683	701	677	643	581	804	475	809	690	695	721	475	772	(745)	749	694	728	734	672	786	773	345	733	543	---	214	633	505	709	625	366	726	736	704	612	527
July 12------	661	687	703	693	697	793	342	755	667	742	676	617	759	(336)	681	779	607	704	662	681	717	401	775	385	---	455	759	718	694	---	395	319	770	701	728	744
July 13------	685	664	350	461	530	767	577	735	681	556	639	638	750	740	549	787	366	392	452	756	460	762	597	540	---	584	756	616	678	670	573	687	623	522	621	608
July 14------	660	678	698	647	518	733	276	671	677	688	722	597	729	272	747	602	693	709	782	680	612	637	721	450	---	565	524	678	665	644	575	574	683	532	609	562
July 15------	657	630	713	684	726	781	121	737	285	540	655	502	463	---	674	792	471	726	583	725	706	777	636	575	---	442	455	641	407	651	537	734	642	147	453	716
Averages------	659	682	647	645	551	750	349	752	631	659	691	574	710	(601)	680	654	593	682	538	738	686	634	707	533	---	413	513	629	635	630	427	612	702	563	580	567
Departures----	---	---	---	---	0	---	---	---	---	131	202	---	---	---	---	---	---	66	---	---	---	---	---	---	---	---	---	88	---	---	---	---	---	---	---	---
July 16------	535	678	647	642	660	778	(477)	783	731	531	625	716	686	---	641	769	629	541	373	793	692	749	523	336	---	322	353	683	707	626	535	602	562	463	713	474
July 17------	633	587	669	649	502	787	644	664	706	772	760	562	747	657	620	794	485	671	713	657	722	438	765	625	---	283	---	749	701	---	569	584	795	531	587	567
July 18------	638	474	610	652	710	790	644	766	584	547	442	548	750	503	672	779	321	688	---	771	723	749	515	301	724	273	445	379	671	628	666	506	552	240	585	532
July 19------	612	176	673	687	709	794	663	769	675	206	382	497	731	(611)	736	788	434	719	---	726	735	468	359	540	552	319	---	511	672	614	685	712	415	327	481	636
July 20------	431	564	621	644	384	685	603	747	633	713	695	554	726	468	726	514	691	684	525	736	754	397	721	536	520	226	418	586	677	430	687	402	694	495	662	716
July 21------	347	644	500	524	553	811	450	747	476	278	569	420	669	(640)	262	757	610	587	807	731	772	744	519	217	701	304	611	451	448	658	713	606	540	517	312	698
July 22------	304	645	441	566	725	802	487	712	439	727	612	157	715	717	413	771	535	616	539	719	(724)	740	661	532	---	353	---	651	631	648	618	619	686	293	560	331
Averages------	500	539	594	623	606	778	(567)	741	606	539	583	493	718	(602)	582	739	529	644	592	733	(732)	612	580	441	625	297	457	573	644	614	639	576	606	409	557	565
Departures----	---	---	---	---	73	---	---	---	---	46	116	---	--	---	---	---	---	50	---	---	---	---	---	---	---	---	---	80	---	---	---	---	---	---	---	---
July 23------	284	615	481	572	417	781	692	710	608	704	693	356	696	648	256	751	677	615	738	769	632	494	691	528	---	531	538	608	680	601	289	698	719	661	704	727
July 24------	465	530	236	333	603	776	343	805	688	603	602	641	604	(440)	470	779	556	213	724	760	539	722	619	253	---	386	714	660	614	666	426	637	592	690	616	396
July 25------	671	626	543	382	646	785	398	773	668	319	719	633	681	472	687	765	437	567	676	701	(646)	721	680	442	---	549	361	612	617	685	593	519	604	---	473	643
July 26------	622	669	659	675	617	778	434	645	675	599	528	645	627	(586)	723	764	592	699	627	579	714	688	577	445	---	442	407	649	407	533	531	574	538	705	667	461
July 27------	595	685	648	(643)	676	781	335	642	644	651	621	658	724	703	721	767	278	695	222	718	695	171	597	552	---	212	462	618	694	667	219	390	633	704	604	678
July 28------	682	687	---	647	150	771	372	550	604	327	468	604	547	562	724	764	528	692	512	661	709	550	504	201	---	350	733	444	524	682	262	358	471	679	604	533
July 29------	670	734	---	664	463	775	473	657	633	---	546	500	674	568	674	758	691	726	372	649	714	538	606	380	---	516	709	267	693	---	570	74	501	656	577	634
Averages------	570	649	513	(559)	510	778	435	683	646	534	597	577	650	(568)	608	764	537	601	553	691	(664)	555	611	400	---	427	561	551	604	634	413	484	580	682	607	582
Departures----	---	---	---	---	-18	---	---	---	---	21	128	---	---	---	---	---	---	37	---	---	---	---	---	---	---	---	---	31	---	---	---	---	---	---	---	---
July 30------	509	505	---	641	522	761	548	734	632	565	670	611	701	(506)	699	753	598	701	60	542	767	562	671	418	---	496	549	529	644	---	639	631	687	504	609	529
July 31------	528	537	---	528	307	754	480	586	664	658	591	541	481	(145)	674	750	102	697	656	196	685	587	665	381	---	442	627	513	431	---	513	224	666	554	581	569
Aug. 1------	258	347	---	530	567	730	649	547	412	409	445	549	667	(470)	647	750	711	646	587	710	563	598	465	480	---	508	708	437	571	---	601	520	456	115	566	331
Aug. 2------	590	460	618	650	(374)	761	595	652	330	409	209	376	725	663	647	605	717	639	603	748	497	356	178	503	---	491	178	350	661	---	633	540	---	302	386	634
Aug. 3------	619	636	337	341	517	(741)	580	511	689	104	106	600	727	202	638	748	570	514	536	691	654	704	340	63	---	123	395	304	658	---	612	273	256	(659)	380	614
Aug. 4------	629	674	533	485	252	728	615	704	589	609	554	401	728	(519)	506	763	409	711	599	657	573	678	511	483	---	117	238	554	642	---	605	440	616	511	548	622
Aug. 5------	353	671	323	318	650	(643)	669	716	470	505	397	484	721	410	520	728	387	543	436	745	726	545	427	302	---	171	404	80	625	---	658	548	---	690	112	476
Averages------	498	547	453	499	(456)	(731)	591	636	541	466	425	509	679	(416)	619	728	499	636	497	613	638	576	465	376	---	335	443	395	612	---	609	454	536	(477)	454	539
Departures----	---	---	--	---	-28	---	---	---	---	-24	-18	---	---	---	---	---	---	63	---	---	---	---	---	---	---	---	---	-74	---	---	---	---	---	---	---	---
Accumulated Departures January 1 to August 5, 1954																																				
	---	---	---	---	97	---	---	---	---	---	---	---	---	---	---	---	--	11193	---	---	---	---	---	---	---	---	---	5012	---	---	---	---	---	---	---	---

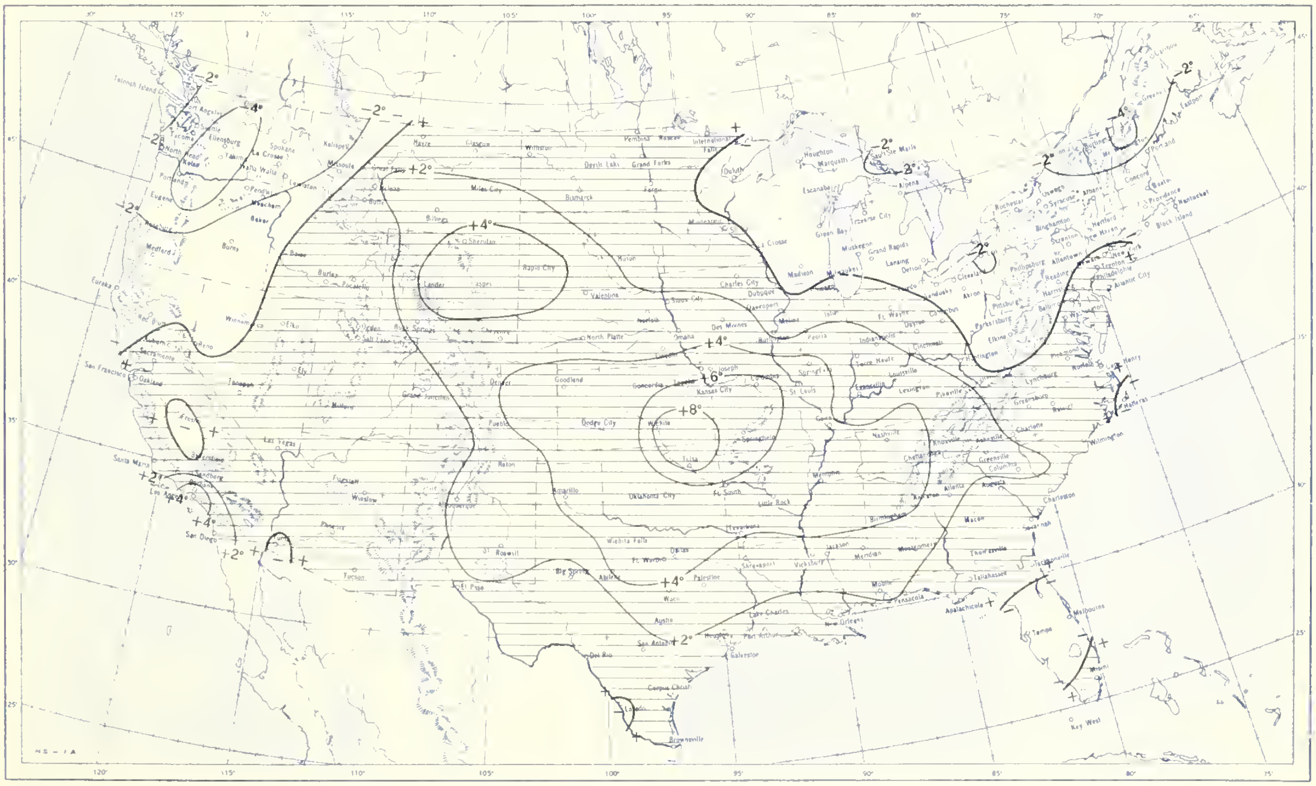
Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

NWRC, Asheville, N.C. --- 10/13/54 --- 1800

Chart I. A. Average Temperature (°F.) at Surface, July 1954.

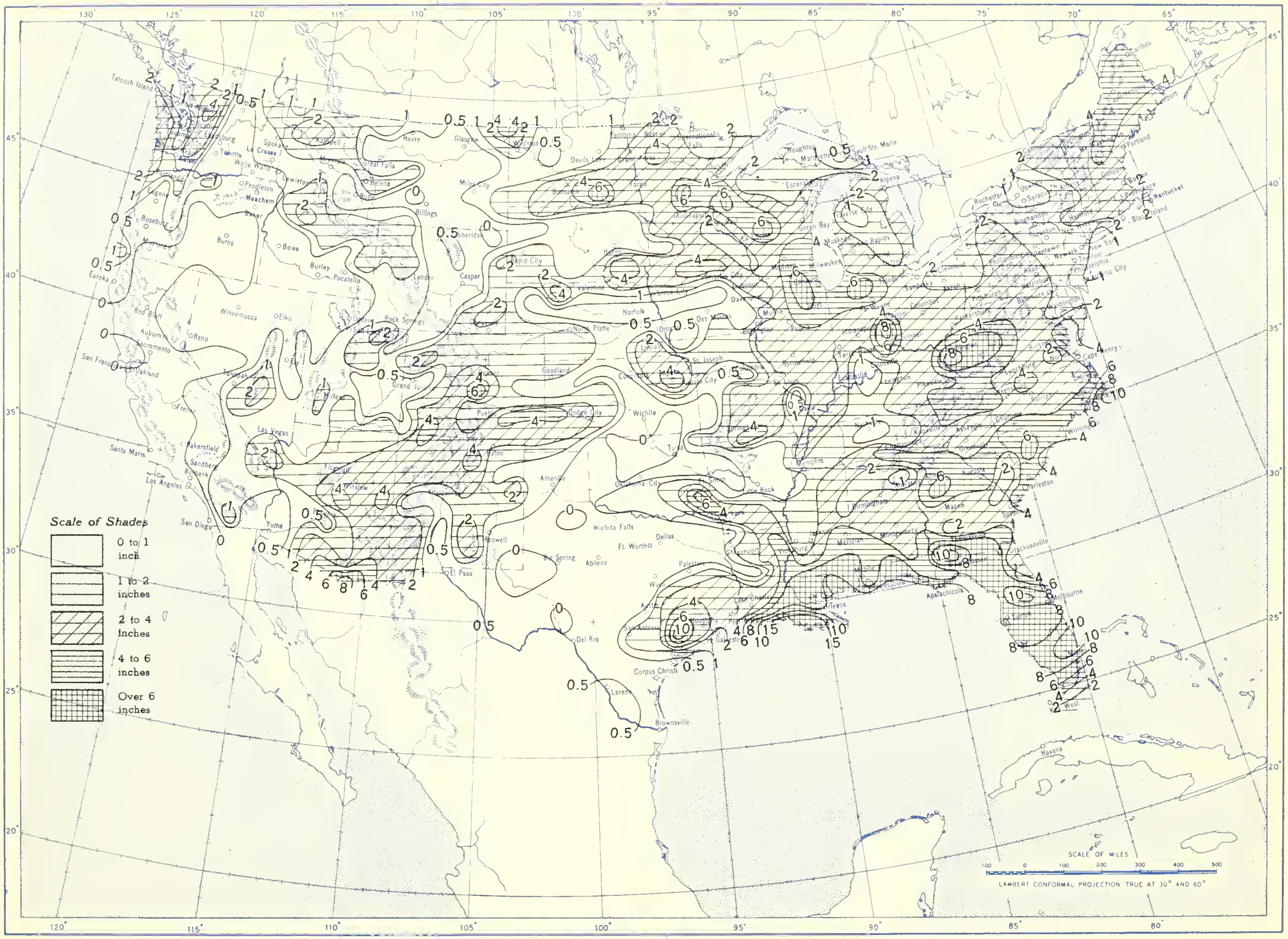


B. Departure of Average Temperature from Normal (°F.), July 1954.



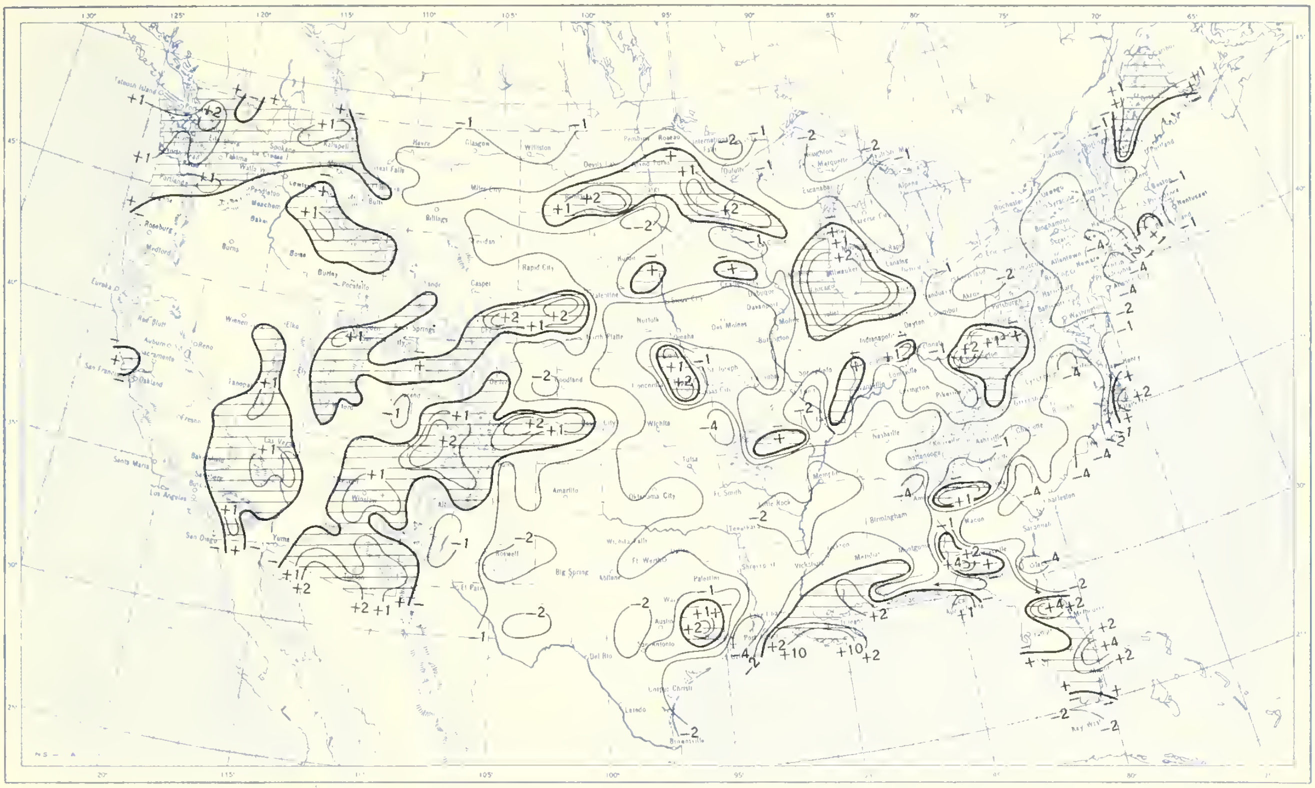
A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively. B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), July 1954.

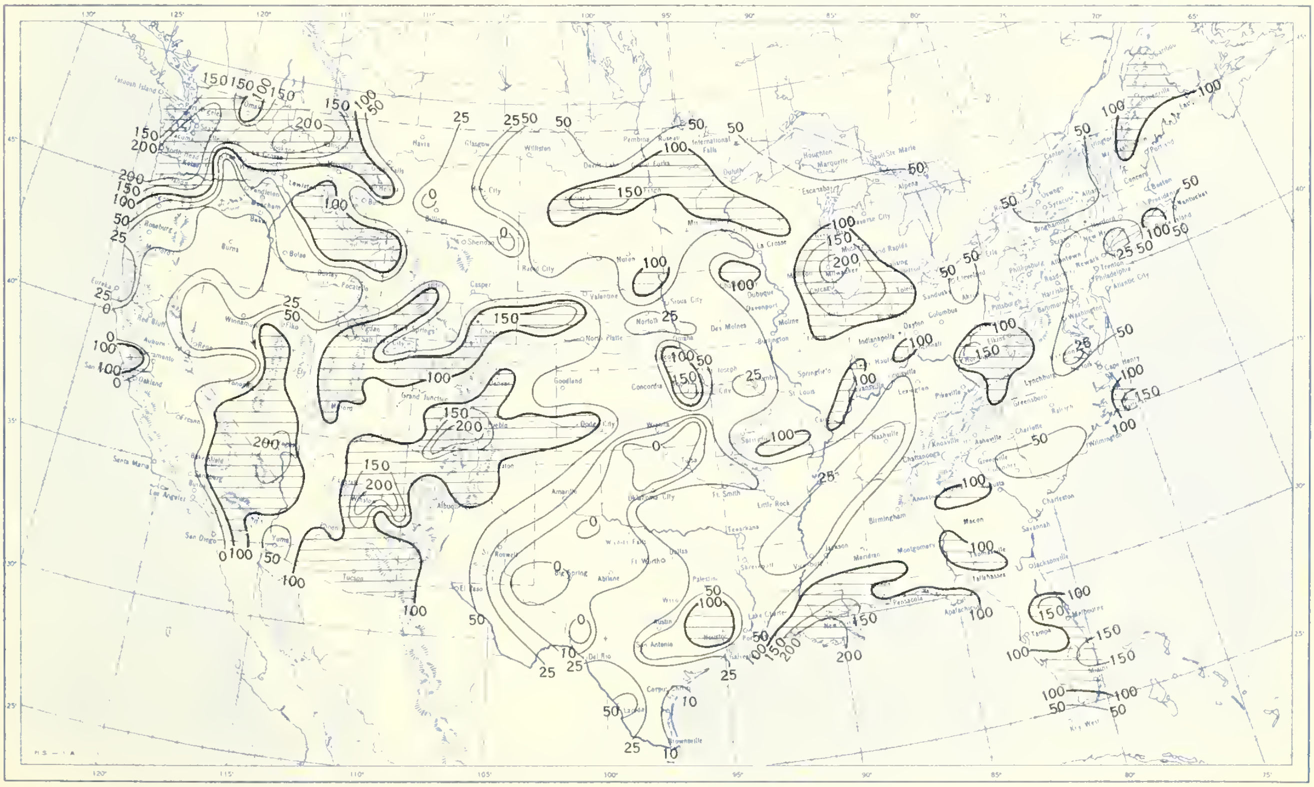


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), July 1954

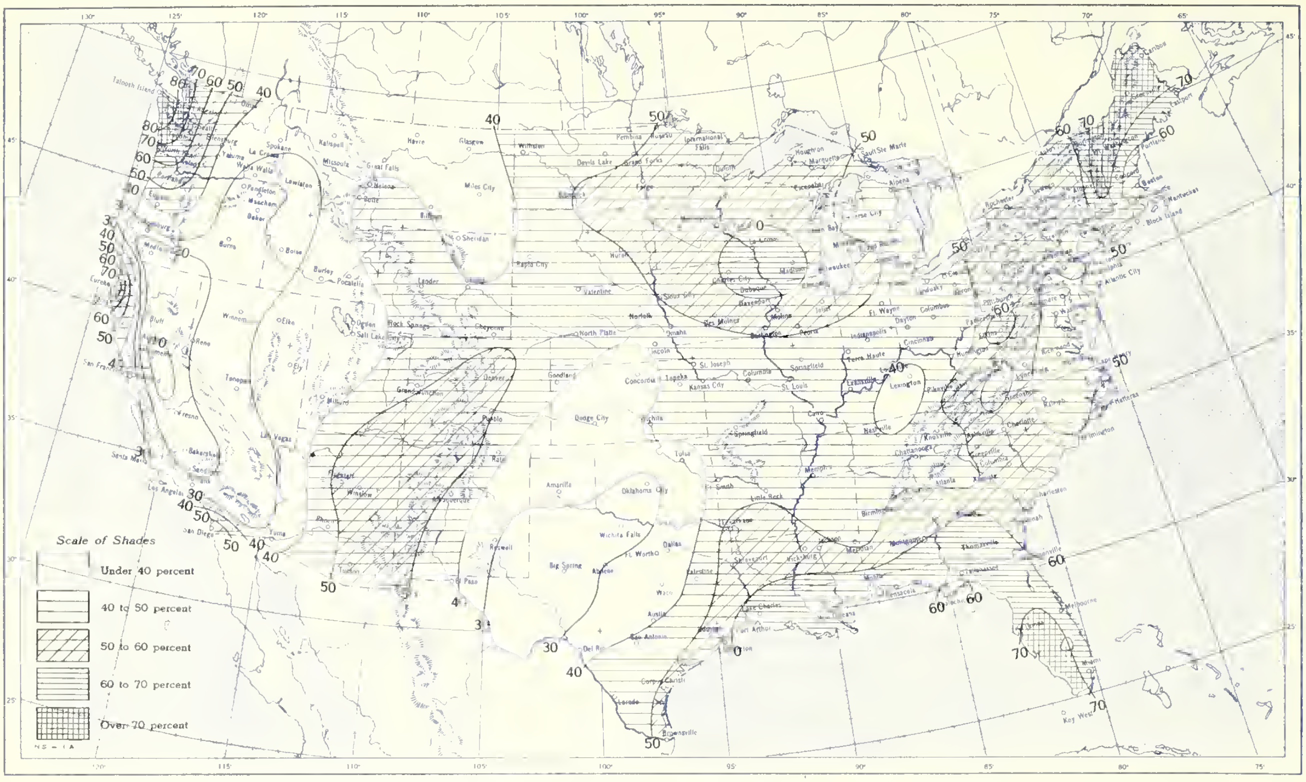


B. Percentage of Normal Precipitation, July 1954

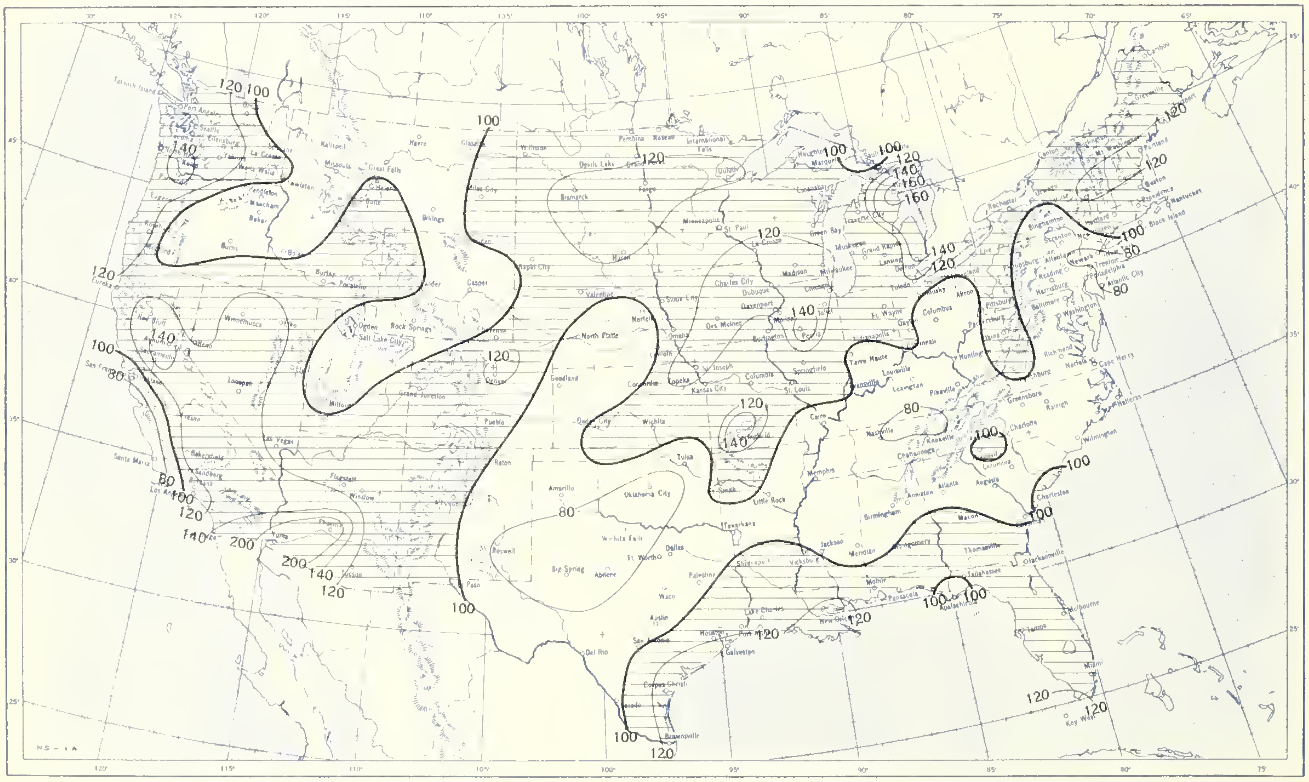


Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, July 1954.

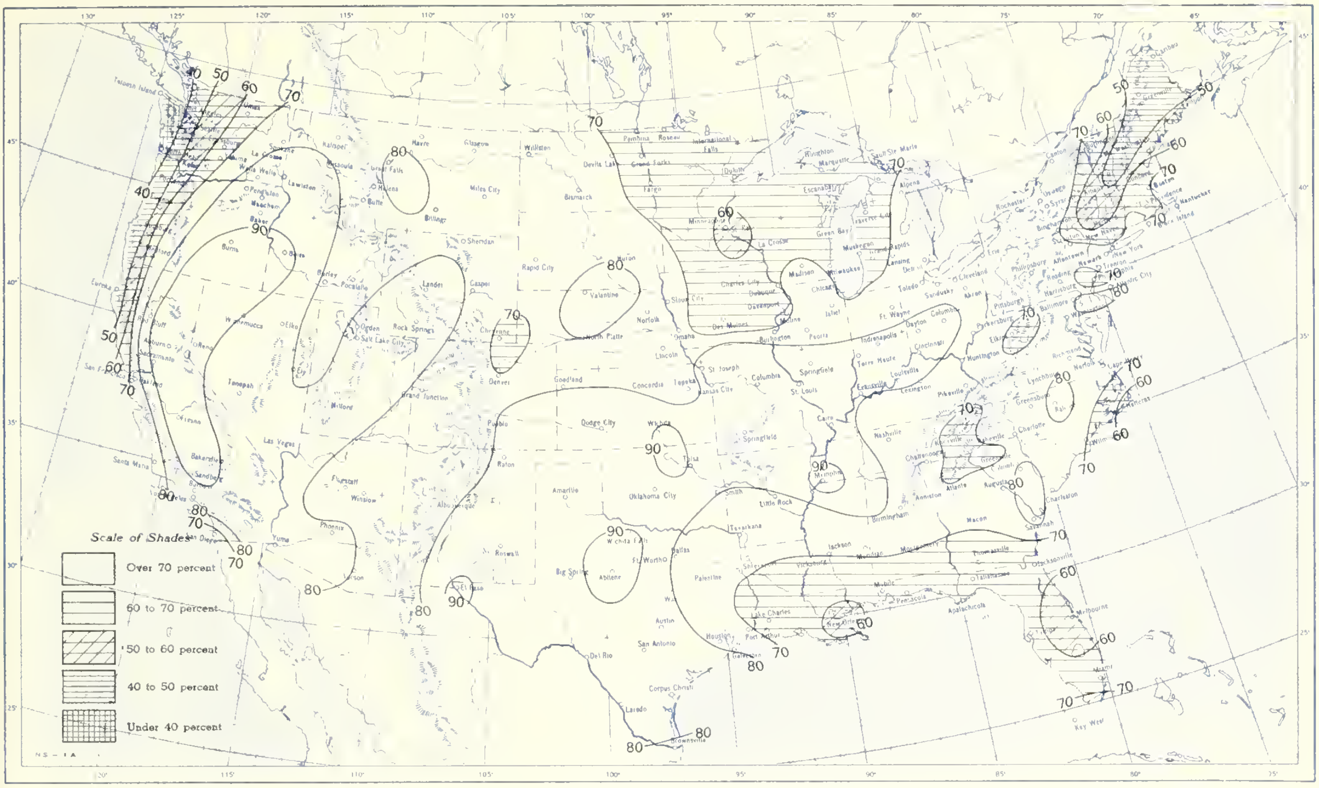


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, July 1954.

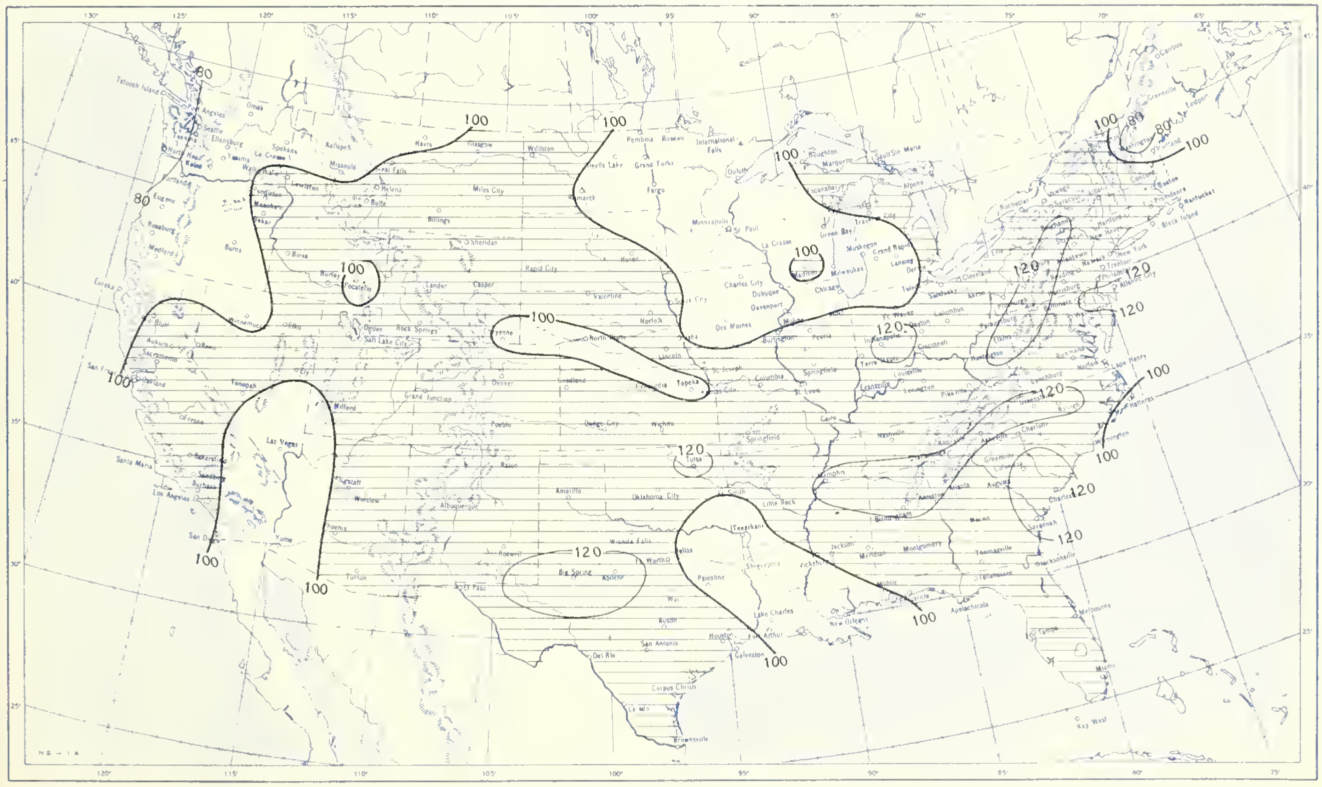


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, July 1954.



B. Percentage of Normal Sunshine, July 1954.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, July 1954. Inset: Percentage of Normal Average Daily Solar Radiation, July 1954.

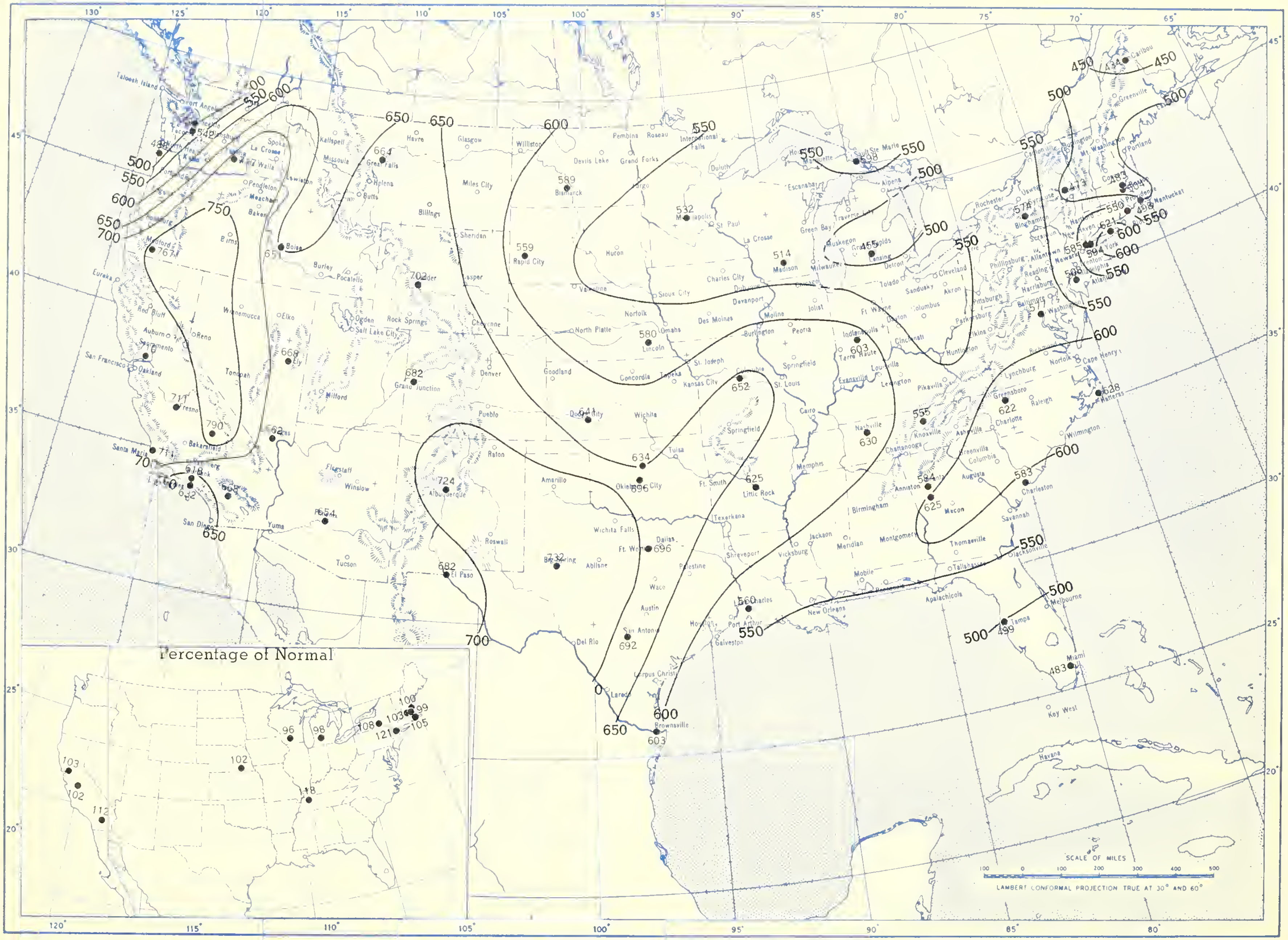
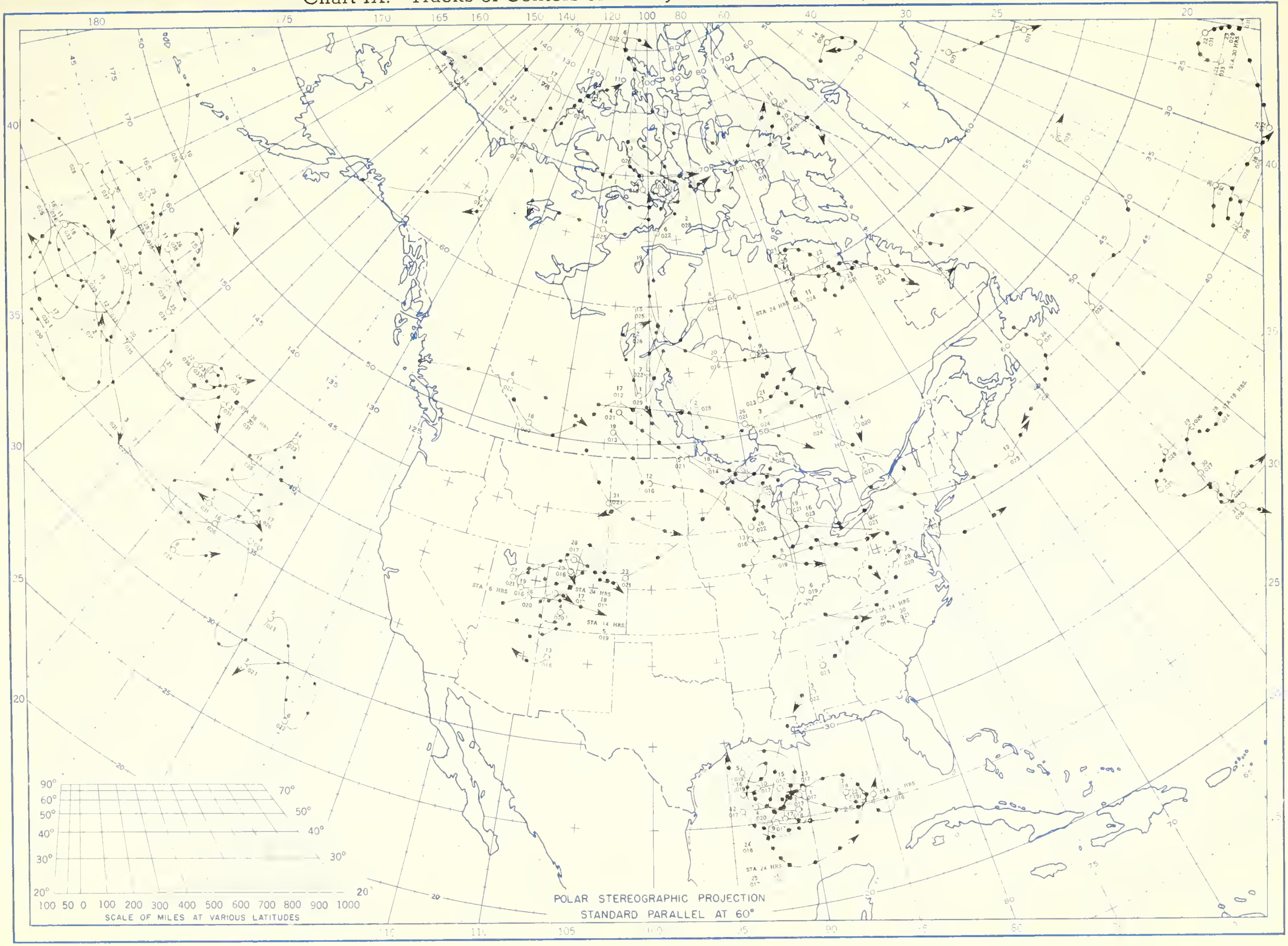


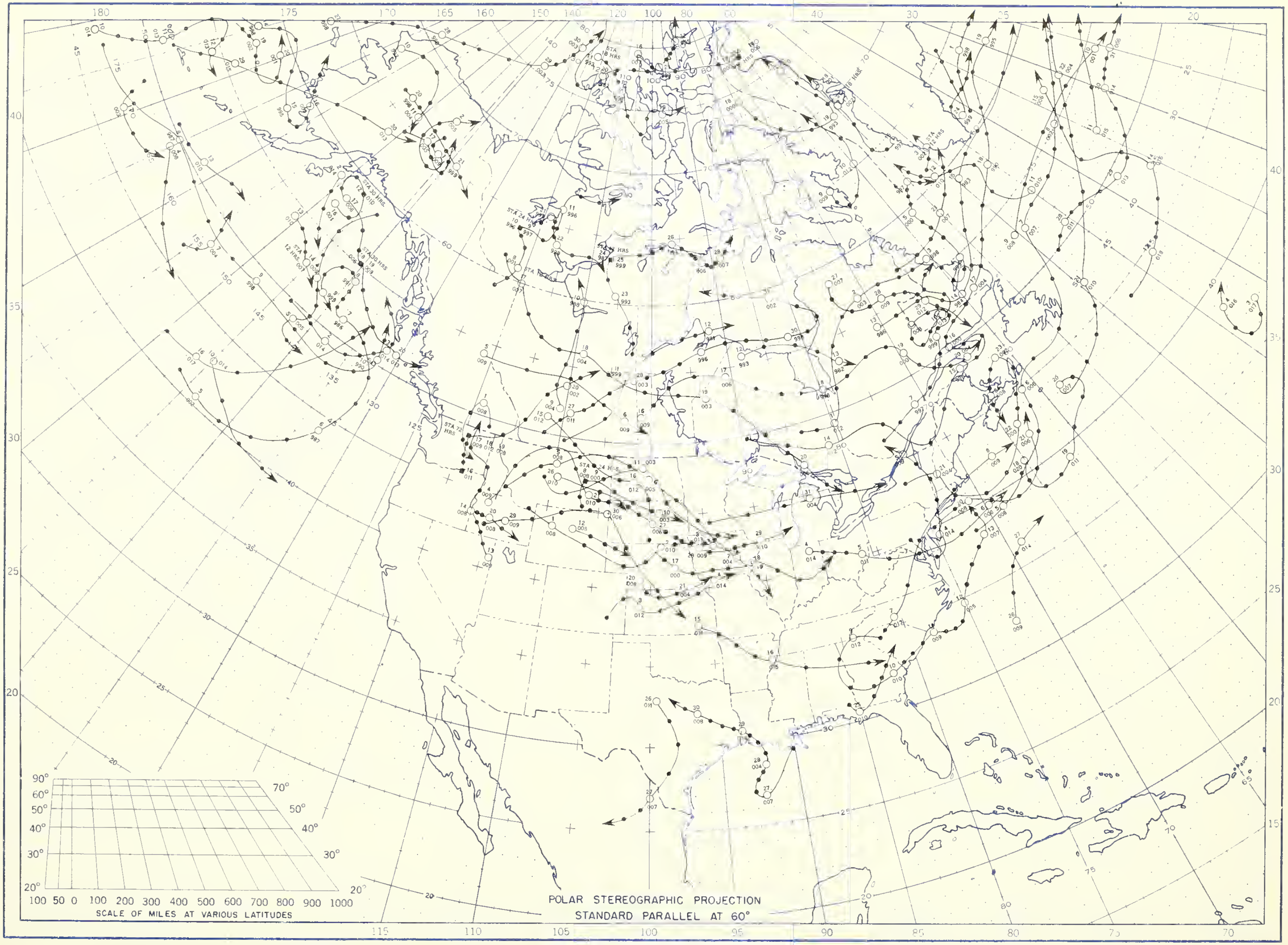
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm.$^{-2}$). Basic data for isolines are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals

Chart IX. Tracks of Centers of Anticyclones at Sea Level, July 1954.



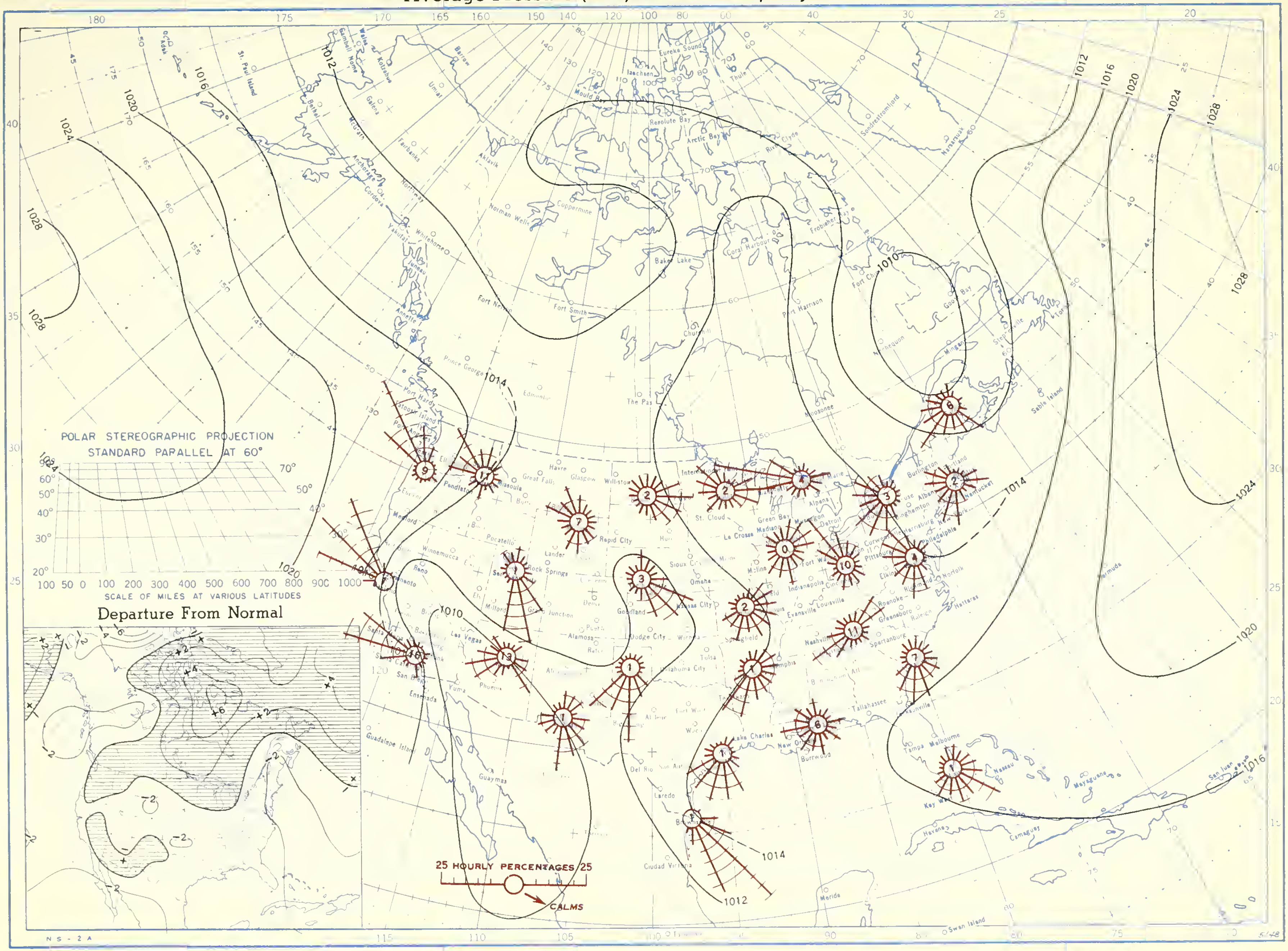
Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

Chart X. Tracks of Centers of Cyclones at Sea Level, July 1954.



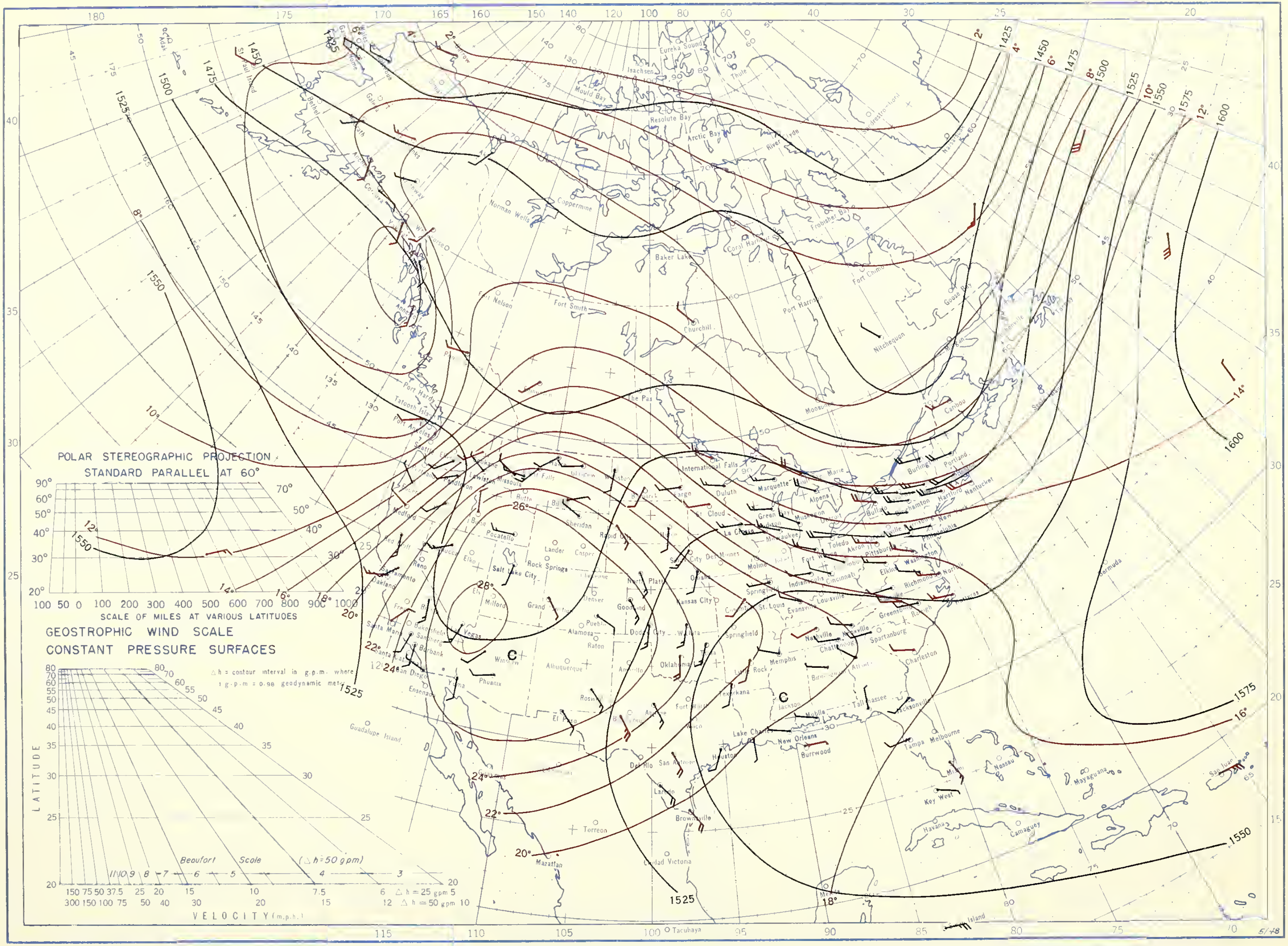
Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, July 1954. Inset: Departure of Average Pressure (mb.) from Normal, July 1954.



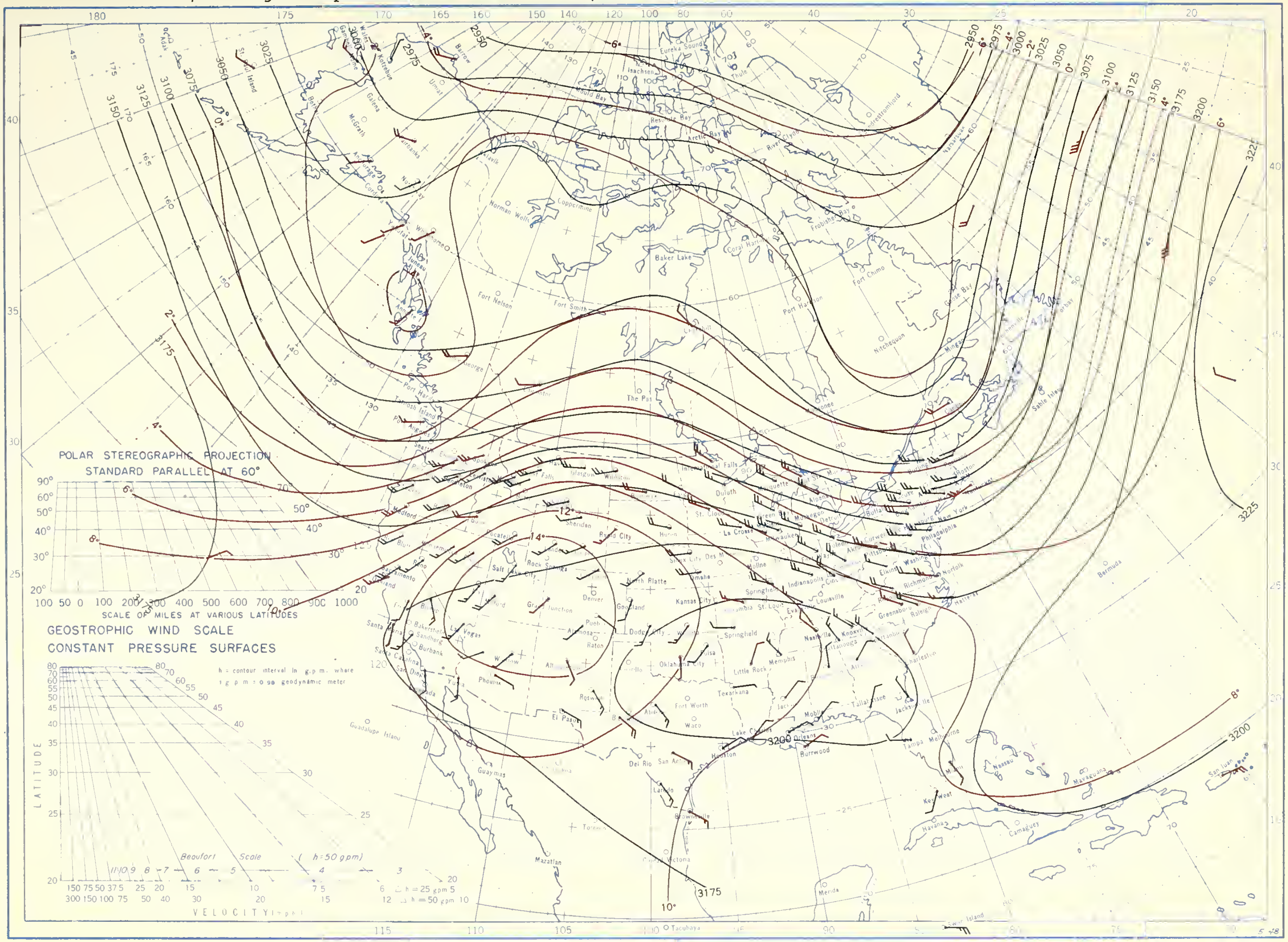
Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), July 1954.



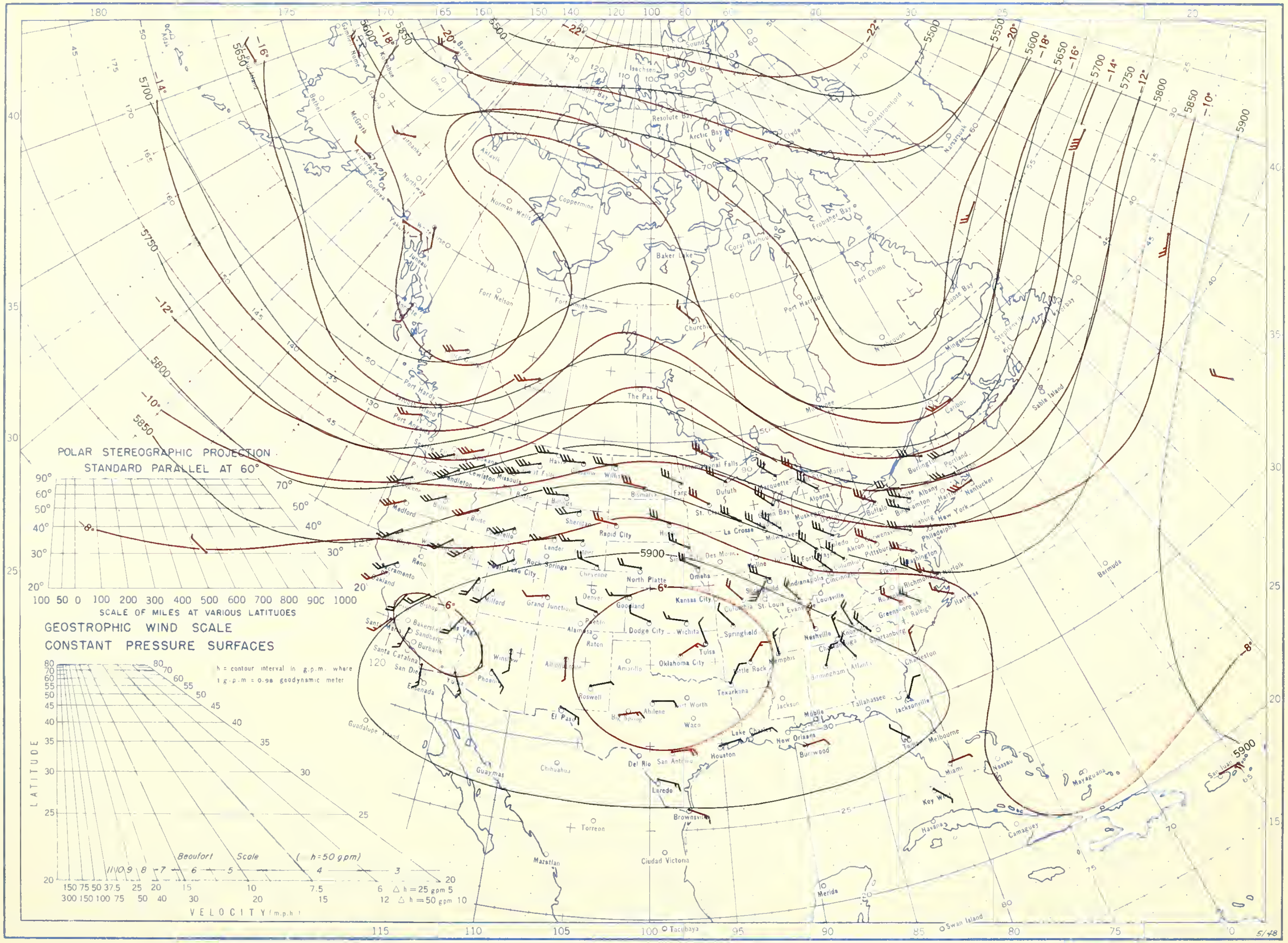
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m.. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), July 1954.



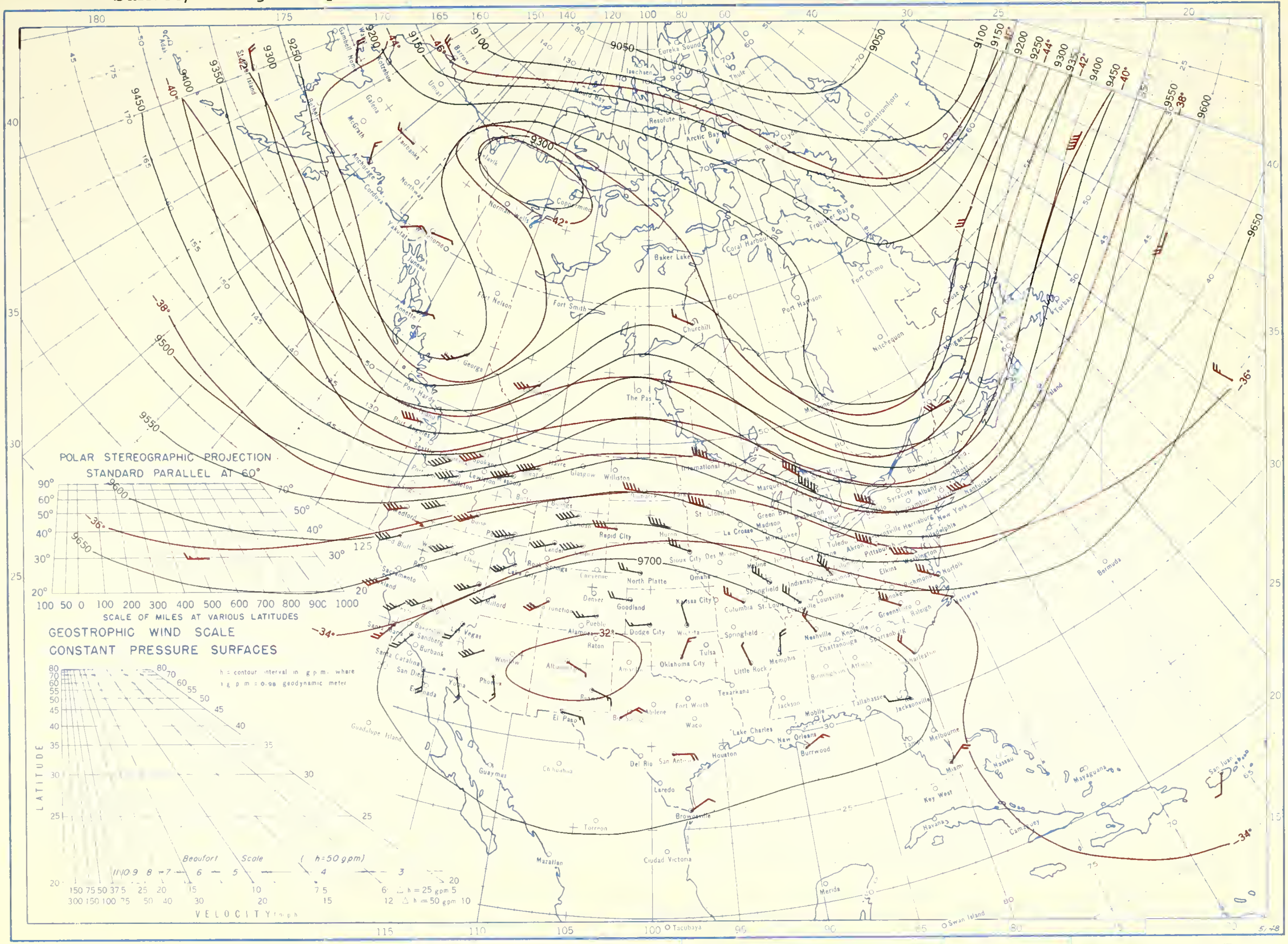
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), July 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.: those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 300-mb. Pressure Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), July 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

AUGUST 1954
Volume 5 No. 8

ASHEVILLE: 1954

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NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

Volume 5 No. 8 AUGUST 1954

GENERAL SUMMARY OF WEATHER CONDITIONS

Weather conditions in the United States during August 1954 were similar in many respects to those which prevailed in the preceding months of June and July. Continued heat and drought contributed to the further decline of crops and water supplies in the South; abnormally cool, showery weather again prevailed in most regions near the Canadian Border; and temperatures continued below normal with unusual persistency in the far West. The most important change in this summer-weather regime during August was the drought-breaking rains in Missouri and parts of Kansas and thence eastward to the Atlantic Coast. An additional important feature of the month was hurricane "Carol" which lashed New England with a fury comparable to the destructive hurricane of September 1938. When the final figures are in, this storm, the costliest in New England's history, may indeed top the list for the entire Country. (See the special article on hurricane "Carol" that follows this summary.)

Thunderstorms this month were unusually frequent in Montana and adjacent areas of Washington and North Dakota, with Helena and Great Falls, Mont., reporting 18 and 17 respectively, which was 11 above the average for August at both stations. The number of these storms was above normal for August in an area extending from Nebraska and Kansas eastward through the Ohio Valley into the Piedmont regions of Virginia and the Carolinas. Lincoln, Nebr., reported thunderstorms on 19 days, which was 11 days above average, and Concordia, Kans., on 20 which was 12 more than average.

August sunshine was much above normal in the southern half of the Country, except along the Pacific Coast where it was alightly below, and was generally below normal elsewhere. Savannah, Ga., and Columbia, S. C., had 142 and 141 percent of normal respectively. In contrast Tatoosh Island, Wash., and Portland, Oreg., had only 34 and 61 percent of normal respectively.

PRECIPITATION.--August rainfall was above normal in the North except in the extreme upper Mississippi Valley and upper Great Lakes region where it was well below, and below normal in the southern portion of the Nation except above in parts of the lower Rocky Mountain States and western Texas.

In most of the area from Kansas, Oklahoma, and eastern Texas to the Atlantic Coast August rainfall was less than 50 percent of normal and in some sections less than 25 percent. Scattered stations had no rain at all or only a trace. The state average for Louisiana (2.63 inches) was the lowest on record for August, and averages for Alabama (1.75 inches) and Mississippi (1.43 inches) were the lowest since 1930.

In the South the dry weather of August was characteristic of the entire summer, and in parts of the Southeast August was the eighth consecutive month with below normal precipitation. The summer rainfall was less than one-half of normal in Oklahoma, Arkansas, and South Carolina. Savannah, Ga., had its driest August, 1.33 inches of rain, and also its driest summer, 5.90 inches. Pensacola, Fla., had its driest August, only 0.63 inch of rain, and its driest January through August period, 20.74 inches. At Wichita, Kans., rainfall totaled only 2.09 inches for the entire summer which was 9.33 inches below normal, and the deficiency for the past 3 years was 31.42 inches.

The effects of the prolonged heat and drought in the South were reflected in the poor condition of crops and low stream flow. In Oklahoma the average monthly stage of the Arkansas River at Tulsa was at an all-time low for any month, and the Canadian River at Wetumka ceased flowing there for the first time since 1900. The combination of high temperatures and low soil moisture took heavy crop toll, particularly in parts of the Southeast. In Georgia cotton, sweetpotatoes, tobacco, pecans, and peanuts were cut 25 percent or more, corn 50 percent, maturing truck and vegetable crops were almost a total loss while heat and drought prevented appreciable planting for fall production. In much of Alabama where conditions were much the same, many trees were reported dying from lack of moisture, fields of early corn in many localities were a complete failure, and late corn ranged from a near failure to about one-half of a crop. In Arkansas hay and pastures were extremely poor, corn was severely damaged (much beyond recovery), soybeans generally were deteriorating, forest fires destroyed thousands of acres of timberland, and streams were near or below the lowest ever recorded. In Mississippi cotton condition was only 65 percent of normal at the end of the month, a drop of 19 percent during the month.

The drought-relieving rains in Missouri and parts of Kansas eastward were the southern portion of a band of heavy rainfall that also covered most of Nebraska, Iowa, northern portions of Illinois, Indiana, and Ohio, and most sections of the middle Atlantic States. Monthly totals ranged up to 17.76 inches in Nebraska, 15.74 in Kansas, 16.13 in Iowa, 11.44 in Missouri, 11.01 in Illinois, and 8.23 inches in Indiana. In the latter two States no station reported less than 2 inches. These rains, while very beneficial, came after crops in parts of Kansas, Nebraska, and the Mississippi Valley had already been reduced by drought and heat, and in some areas more rain was still needed to offset the long dry spell.

Rainfall was unusually heavy for August in Montana, northern Idaho, Washington, Oregon, and northern California. In the latter State much of the rain fell during an unprecedented storm the last week. At many stations previous records for 1-day and monthly totals were greatly exceeded. The rains caused tremendous losses of prunes and heavy losses of hops in Sonoma County, Calif., where the rainfall was several times that which fell in the previous wettest Augusts of 1916 and 1953. As an example, Cloverdale measured 2.22 inches for August 1954 and only 0.33 inch in 1916, the previous record amount for August. In the lower Sacramento Valley, the rains, falling at the peak of the peach harvest, resulted in losses estimated at $3,000,000. In other areas the rains caused some grain and hay losses, but favored range growth.

TEMPERATURE.--In an area extending from the lower Great Plains to the Atlantic Coast intense and persistent heat has seldom been equaled in August. The monthly average for Alabama equaled the all-time record in July 1930, and averages for Arkansas (85.3°), Mississippi (84.6°), Georgia (82.7°), and Florida (83.4°) set new August records. Macon, Ga. (84.6°) and Vicksburg, Miss. (85.5°) had record high averages for any month. At Little Rock, Ark., the maximum temperature reached or exceeded 100° on 21 days during the month.

In sharp contrast the month was notable for its low average and extreme temperatures in the far West. The average temperature for Oregon, 61.3°, set a new low August record, and Portland with an average of 64.4° experienced its coolest August in 84 years. On the 26th Fish Creek, Nev., recorded 17° which established a new August low for the State. Parts of northern California, particularly the Sacramento Valley, also experienced their coolest August, and heavy snow fell in the vicinity of Mt. Shasta above 2,500 feet on the 27th and 28th. Some snowfall was also reported in the mountains of Idaho on the 20th. During the third week of the coolest August in Utah since 1941 early frost nipped corn in Beaver County where it had to be cut for silage.

The abnormally cool weather in the Northeast was marked by heavy snowfall (unusually early for the season) at Beecher Falls and Lincoln, Vt., for about an hour on the 11th.

Highest temperatures occurred in Northern Border regions east of the Continental Divide and along the Gulf and Pacific Coasts during the last week, the central Great Plains and most of the far western interior during the first 3 days of the month, and from the middle Mississippi Valley eastward and along the Atlantic Coast from northern Florida to southern New England about midmonth. The highest of the month was 120° in California at Greenland Ranch on the 1st and 30th and Cow Creek on the 31st.

Lowest temperatures east of the Rocky Mountains were recorded at most stations either during the second week or the closing days of the month, and in most of the far western interior during cool spells at the middle and end of the month. The 17° recorded at Fish Creek, Nev., was also the month's extreme low for the United States.

August 1954 ended one of the hottest summers (June, July, and August) on record from Kansas, Oklahoma, and Texas eastward to the Atlantic Coast. In Arkansas the mercury rose to 100° or above on 49 days at Fort Smith and on 43 days at Little Rock where the previous record number of days with 100° or above for a year was 20 in 1943. At Tulsa, Okla., the temperature rose to 90° or above on 83 days during the summer and to 100° or above on 40 days during July and August. At Greenville, Ala., August 31 marked the 87th consecutive day on which maxima had equaled or exceeded 90°. This summer was the hottest on record in Georgia, the second hottest in Arkansas, and the third hottest in Oklahoma. In the latter State the average temperature, 87.7°, for the two-month period of July and August was the highest on record.

SEVERE STORMS.--During August 1954 storms, other than hurricane "Carol", were responsible for the death of 45 persons, injuries to 91 others, and reported material losses of more than $26 million.

Hail and wind caused over $4 million of this total in Kansas on the 1st, damage occurring in Ellis, Rush, Pawnee, Washington, Republic, and Clay Counties. On the 5th heavy rain and hail and the resulting heavy runoff caused $1,400,000 property damage in eastern El Paso and western Elbert Counties.

Hail damage in eastern Connecticut, Rhode Island, and western Massachusetts on the 11th was estimated at $1,000,000 damage.

Property damage from windsqualls in central Illinois on the 18th resulted in total damage of $1,500,000. Hail this summer had been unusually frequent in northern areas. These storms caused well over $5 million damage in Montana during August, the greatest for this month since 1948. Illinois reported $12,000,000 losses from these storms during the summer.

THE STORM OF AUGUST 31, 1954

HURRICANE CAROL AUGUST 26-31, 1954

by James K. McGuire

Introduction

The outstanding feature of the month's weather was the occurrence of hurricane "Carol" during the 26-31st. This storm, the third of the 1954-55 hurricane season, moved up the East Coast to strike Long Island and New England on the final day of August. Its effects on shore points from North Carolina to New Jersey were relatively slight, but assumed disastrous proportions when the center moved inland over Long Island and New England. In these areas its intensity was comparable to that of the great hurricane of September 21, 1938. It caused approximately sixty deaths and 1000 injuries, considerably less than the 1938 storm. Estimated crop and property losses, however, amounted to over $460,000,000, a figure exceeding that of any other storm or natural catastrophe on record for the United States.

Path of the Hurricane

"Carol" formed in the Atlantic east of the northern portion of the Bahama Islands about the 25th or 26th of August. Its early history, rather characteristic of this type of storm, was one of gradual development, and slow, uncertain movement. At 1:30 A.M. (EST) on the 26th, it was centered near latitude 27°N., longitude 76°W., or 300 miles east-northeast of Miami. It thence headed on a wavering northward course, and at 1:30 A.M. (EST) of the 29th had traveled less than 300 miles to a central location near latitude 30°N., longitude 77°W., some 200 miles off the extreme northeastern coast of Florida.

On the 29th, still moving sluggishly, "Carol" changed direction to northwestward. This change in course, at first posing a threat to the South Carolina shore, developed within twenty-four hours into a return to a northerly heading. At 5 A.M. (EST) of the 30th, the hurricane was centered near latitude 32°N., longitude 78°W., or about 150 miles east-southeast of Charleston, S. C.; it was moving at about 5 m.p.h. toward the north. By noon, heading slightly east of north at the same slow speed, the center had reached latitude 33°N., longitude 73°W., or about 100 miles south-southeast of Wilmington, N. C.

"Carol", now grown into a large storm, was entered upon the second or mature stage of its career. An official bulletin issued at 1 P.M. (EST) on the 30th stated that it was still moving very slowly north-northeastward but increasing in intensity. Winds near the center were reported to be over 100 m.p.h., while winds of hurricane force (over 72 m.p.h.) extended over 100 miles to the east of the center and 50-60 miles to the west. Gales (over 38 m.p.h.) ranged farther outwards, 200 miles to the east and about half that distance to the west. The bulletin repeated an earlier warning to rush all precautions against dangerous winds and high tides along the North Carolina coast.

These warnings were verified within the next twelve hours, as the western side of "Carol" lashed the shore from Wilmington northward to Cape Hatteras. Damage amounted to an estimated $227,500. Strong winds tore down power and telephone lines, and the Trent and Neuse Rivers, their levels raised by the high waters accompanying the storm, flooded the waterfront section of New Bern. A peak gust of 78 m.p.h. was observed at the Hatteras station of the Weather Bureau.

Late on the 30th, the hurricane's center passed a few miles east of Cape Hatteras. At 11 P.M. (EST), "Carol" was centered near latitude 36°N., longitude 75°W., or about 100 miles south-southeast of Norfolk, Va. Its size and the strength of its winds remained about the same, but a rapid and sharp increase occurred in the rate of forward motion as it passed north-northeastward along the Middle Atlantic coast during the early morning of the 31st. The forward speed, accelerated to 40 m.p.h., brought the center over extreme eastern Long Island by 9 A.M. (EST).

The effects of the hurricane's passage from the Virginia shore area to Long Island were comparatively slight. The track of the center was 75-100 miles east of the mainland, so that dangerous winds did not reach westward to the coast. Waves were high, however, and boardwalks and similar beach installations were damaged, particularly in New Jersey, while numerous small pleasure and fishing craft dragged their moorings or broke loose altogether. The amount of damage in New Jersey was estimated at $250,000. No monetary estimates of damage in Virginia, Maryland, and Delaware were received but it is known to have been minor.

The impact of the storm on Long Island and New England, to be described below, was far more serious. The center crossed the south shore of Long Island slightly east of West Hampton about 8:30 A.M. (EST). An hour later, it passed into Long Island Sound off Cutchogue. By 10:30 A.M. (EST), it was over the southeast shore of Connecticut near the mouth of the Connecticut River. Curving slightly on a northward course, the center passed 5-10 miles west of Worcester, Mass., about noon and penetrated into south-central New Hampshire about 1:30 P.M. (EST).

In mid-afternoon, "Carol" passed into the third and final stage of its history. The strength of its winds and its speed of forward progress diminished as the center traveled northward over the rugged terrain of New Hampshire. At 7:30 P.M. (EST), the center was located at latitude 46°N., longitude 71°W., just north of the Canadian border, and the weakening storm had lost all hurricane force.

"Carol" brought moderate to heavy rainfall to New England, eastern portions of New York and Pennsylvania, New Jersey and the coast from Delaware to North Carolina. Rain was not a significant factor in the hurricane's havoc, since it produced only minor local floodings, though it did contribute to highway accidents and to the discomfort of those affected by the storm.

Effects of the Hurricane

In the Long Island-New England area, the storm damage may be divided into three principal classes. The first, caused by wind alone, was most severe over the region east of the hurricane's center line of passage and south of the northern border of Massachusetts. This region included Long Island east of Riverhead; New London, Tolland and Windham Cos. in extreme eastern Connecticut; all of Rhode Island; and Massachusetts east of the Webster-Worcester-Fitchburg line out to the "elbow" of Cape Cod. This area was swept during the morning by sustained winds of hurricane force with gusts up to 125 m.p.h. Countless trees were toppled, blocking roads, smashing buildings and automobiles, wrecking electric and telephone lines. Enormous destruction was done to roofs, chimneys, steeples, aerials, signs, windows, store fronts, radio and TV towers. All forms of transportation were crippled. In this heavily-populated area, the ordinary activities of daily living were forcibly suspended by the storm. Hundreds of thousands of families had to do without telephone service and without electricity for cooking and lighting for days until utility workers were able to effect repairs. Streets and highways were quickly cleared of fallen trees, but not until a week had elapsed were utility services generally restored to normal. In addition, numerous factories (in Rhode Island especially) were so badly damaged that workers could not return to their jobs for periods ranging from several days to three weeks, with consequent heavy financial loss.

Similar but lesser devestation took place during the morning over central Long Island and the strip of Massachusetts and Connecticut extending from the hurricane's center line to the Connecticut Valley. This district was lashed by 45 to 55 m.p.h. sustained winds, with gusts to 65 m.p.h., and by even higher winds close to the center of the storm. In the afternoon, winds of like force pummeled the southwestern corner of New Hampshire, the portion of the same state east of the storm's center line and south of Lake Winnipesaukee, and southwestern and south-central Maine. Along the New Hampshire and Maine coasts east to the Kennebec River, winds were higher than over the rest of northern New England; sustained speeds were in the 60-70 m.p.h. class and gusts ranged to 80 m.p.h. Vermont, central and northern New Hampshire, most of Maine, and the western parts of Massachusetts and Connecticut experienced gale force winds, but no really severe velocities, and the same condition held true for eastern New York State including the western end of Long Island.

The second type of storm damage was that inflicted on shore areas by inundating ocean waters. The hurricane struck Long Island and southern New England close to the time of high tide; this circumstance meant that the waves stirred up by the violent winds flooded harbors, beaches and similar low-lying areas and wrecked everything in their path. Seaside resorts, thronged by thousands of vacationists, were thus areas of particularly heavy damage. Were it not for the prompt and efficient measures taken by local governmental, police and civilian defense agencies to evacuate people from beach cottages and hotels the loss of life would have been far greater. Wave damage extended during the afternoon to include the New Hampshire shore and much of the Maine coast.

The third type of damage was the havoc done to pleasure and fishing craft by the combined action of wind and water. An estimated 3000 small craft were thereby either seriously damaged or destroyed, as they were torn from their moorings, sunk, or pounded ashore.

A fourth category of damage, that to crops, will be the subject of a later section in this report. The immediately following sections describe in more detail the hurricane's effects on southeastern New York State and each of the New England States.

New York State

As stated above, the center of the hurricane traversed the eastern end of Long Island along the West Hampton-Cutchogue line during the hour between 8:30 and 9:30 A.M. (EST). Severe wind damage occurred from about the Sayville-Port Jefferson line all the way out to Montauk Point, and was at a maximum between the West Hampton-Riverhead-Cutchogue area and Montauk Point. From the Bayshore-Islip-Northport area westward, wind damage was less severe and was relatively small in and around New York City. Water and marine damage, however, was heavy all along the Sound on both the Long Island and Westchester shores. This type of damage was also high along the eastern and central portions of the southern coast of Long Island. Montauk Point was isolated by a severe washout east of Amagansett, and the 300 ft. Mackay Radio tower there was blown down. In Port Jefferson harbor, on the north shore, over forty small craft were damaged or destroyed. The 200 ft. ferryboat "Orient" was driven ashore by the storm. Peak wind gusts reported during the hurricane at Long Island locations include: 54 m.p.h. at New York International Airport; 62 m.p.h. at La Guardia Field, 85 m.p.h. (rooftop level) and estimated 125 m.p.h. (410 ft. level) at Brookhaven National Laboratory.

Connecticut

"Carol's" center traversed the extreme eastern part of the State between 10:30 and 11:30 A.M. (EST). Wind damage was relatively light in western Connecticut, but increased eastward from moderate to severe over the rest of the state. Water and marine damage was heavy along the entire coast, and greatest in the New London-Groton-Mystic area. In these towns, waters flooded not only the beach area but the business and permanent residential districts as well. Notable also was water damage at Stonington, in the New Haven area, at Bridgeport and Stamford. New London, Middlesex and New Haven Counties were designated disaster areas. Peak gusts observed during the hurricane are the following: 60 m.p.h. at Bridgeport, 64 m.p.h. at Hartford, 65 m.p.h. at New Haven; and 70 m.p.h. at Windsor Locks.

Rhode Island

This state was very hard hit, being in the zone of strongest winds as the hurricane passed northward through nearby Connecticut. Its southern coast and numerous waterways associated with Narragansett Bay were scenes of enormous water and marine damage. Westerly was especially hard hit, and the downtown section of Providence was flooded. Indeed, the worst of the hurricane's fury was concentrated on this State, all of which was declared a disaster area. A peak gust of 105 m.p.h. was recorded at the Providence Weather Bureau Airport Station; 130 m.p.h. at Block Island, and an estimated 125 m.p.h. at Quonset Point Naval Air Station.

Massachusetts

The center of the hurricane traversed the state from about 11:30 A.M. to 12:30 P.M. (EST). Wind damage was light in the western third of the state, moderate-heavy in the central portion, and heavy throughout the entire eastern area, except relatively light on Martha's Vineyard, Nantucket and the outer part of Cape Cod. Water and marine damage was heavy all along the coast, with the maximum in Buzzard's Bay and along the southern side of the Cape eastward to Chatham. Population centers, such as Fall River, New Bedford, Brockton, Boston, Worcester, Lawrence and Lowell sustained major wind losses. In Boston, a noteworthy feature of the storm was the toppling of the steeple of historic Old North Church. The following counties were designated disaster areas: Suffolk, Essex, Middlesex, Norfolk, Plymouth, Bristol, Barnstable, Dukes and Nantucket. Peak gusts include: 100 m.p.h. at Boston, 125 m.p.h. at Blue Hill Observatory in Milton, 88 m.p.h. at Otis Air Force Base near Falmouth, 77 m.p.h. at Nantucket, 52 m.p.h. at Pittsfield, 93 m.p.h. at Salem U. S. Coast Guard Air Station, and 71 m.p.h. at Westover Air Force Base Near Springfield.

New Hampshire

The center of the hurricane pushed northward through the state during the afternoon. Since the storm's intensity was diminishing, central and northern New Hampshire sustained relatively light wind damage. This type of damage was moderate-heavy in the southern portion, and greatest in the southeast, where Strafford County was designated a disaster area. Water and marine damage was considerable along the coast, at such crowded beach and boating centers as Hampton, Portsmouth, Exeter, New Castle and Dover. In addition, approximately 150 small craft on Lake Winnipesaukee were damaged or destroyed. The following peak gusts were experienced in New Hampshire: 63 m.p.h. at Concord, 65 m.p.h. at Laconia, 41 m.p.h. at Lebanon, and 52 m.p.h. at Grenier Air Force Base near Manchester.

Vermont

This state was on the eastern side of the weakening hurricane as it travelled northward through New Hampshire, and thus had the least damage of any part of New England. Heaviest property and utility damage was experienced in Brattleboro and adjacent areas in the southeast. Montpelier's peak gust was 35 m.p.h., Newport's was 25 m.p.h., Burlington's 50 m.p.h.

Maine

This state, on the dangerous side of the storm, sustained heavy wind, water and marine losses. Most of the damage was suffered in the southwest and south-central portions, and along the coast eastward to Bath. The northeastern coast and the northern interior was out of range of the severe part of the storm. York, Cumberland, Sagadahoc, Lincoln, Knox and Waldo Counties were designated disaster areas. Portland, Brunswick, Auburn-Lewiston and Augusta were hard hit. Peak gusts include: 73 m.p.h. at Dow Air Force Base near Bangor, 78 m.p.h. at Portland, 84 m.p.h. at Brunswick Naval Air Station, estimated 40 m.p.h. at Greenville, 48 m.p.h. at Houlton, and 50 m.p.h. at Old Town.

Property and Crop Damage

It is impossible without a long and repetitious catalogue of damage by separate locality to give a comprehensive survey of the huge amount of property destroyed or damaged by the hurricane. Moreover, due to the very magnitude of the storm, a detailed accounting of its havoc is impracticable. Only general estimates, based on reliable reports from the American Red Cross, insurance companies, and various governmental agencies, are available.

Some representative samples of damage, however, will give an idea of the extent of the destruction. The number of trees downed by the hurricane, for example, is simply incalculable. They littered street after street, highway after highway, over Long Island and in New England. In Massachusetts alone, an estimated 50,000,000 board feet of lumber was downed. In toppling, the trees took down hundreds of miles of electric and telephone lines, and utility poles were felled with like results. In New England a quarter of a million telephones were thus put out of order and 2,500,000 feet of wire was torn down. On Long Island, 275,000 customers of Long Island Lighting Service were deprived of electric service, and there and in adjacent New York City and Westchester County 13,000 telephones were rendered silent. Repair crews, augmented by workers rushed from other parts of the country, toiled for days to untangle the devastation and to restore normal facilities. The cost of such repairs, the simultaneous loss of revenue, and the losses to customers dependent on utility services, were by themselves more than the over-all damage of most storms. Food spoilage resulting from lack of refrigeration was estimated at more than $1,000,000. Electric utilities suffered losses both to property and revenue of about $3,000,000. Telephone losses, for property alone, exceeded $5,000,000.

Wind damage to homes, farms, stores, factories, and other types of structures was enormous, both in point of number of buildings affected and aggregate damage. Losses to insured property alone ran close to $100,000,000. This includes neither damage of comparable magnitude to uninsured property, nor the losses caused by water damage. The National Association of Mutual Insurance Companies placed the number of claims at over 200,000, ranging from broken windows, smashed store fronts and shattered chimneys to ripped-off roofs, wrecked porches, and smashed homes. Damage to automobiles, flooded by inundating waters or struck by falling trees, was huge but no special survey of this type of loss has been made. As for number of buildings damaged, the American Red Cross listed 1,545 homes destroyed in the New England-Long Island area, and 9,720 damaged, of which 1970 were major damage. Marine damage was likewise widespread and vast. Losses to pleasure and fishing craft amounted to about $25,000,000, and occurred as hundreds of vessels were hurled ashore or sunk at their moorings.

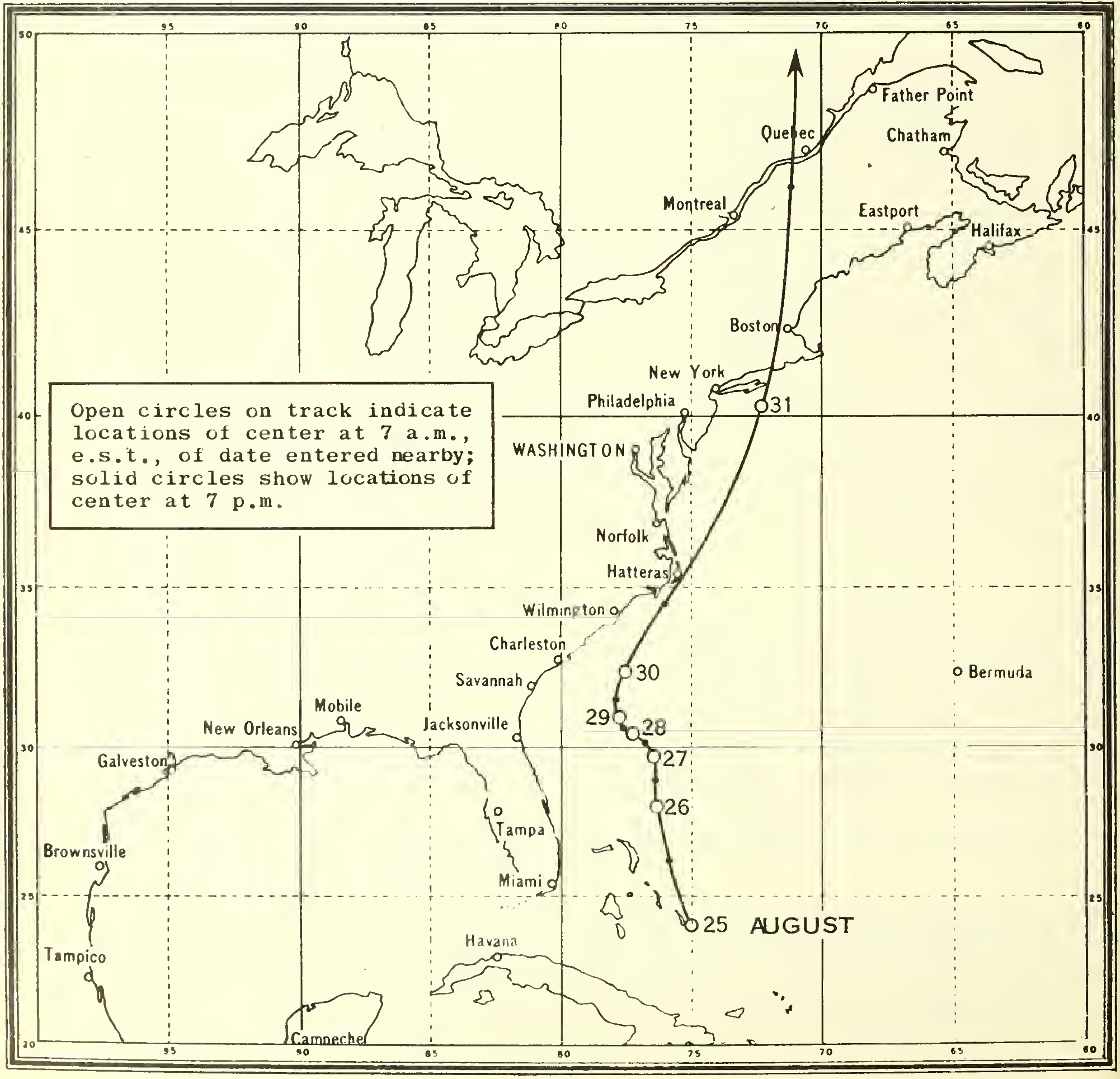
The above are merely high-lights of the kind of havoc wreaked by the hurricane, but serve to show that an overall estimate of $438,300,000 in property losses is not wide of the mark. This may be divided as follows: New York State (mainly Long Island), $5,000,000; Connecticut, $50,000,000; Rhode Island, $200,000,000; Massachusetts, $175,000,000; New Hampshire, $3,000,000; Maine, $5,000,000, and Vermont, $300,000.

Crop losses are more difficult to estimate, because the value of the damaged produce is a rather uncertain quantity. The hardest-hit crop in New England was the apple crop, about 40% of which was blown down. The heaviest blow-off occurred in Rhode Island, eastern Massachusetts, southeastern New Hampshire, and southern and central Maine. The blow-off was moderate in Connecticut and relatively light in western Massachusetts and Vermont. Substantial damage to silage corn, sweet corn, peaches and tomatoes also occurred; damage to tobacco and cranberries was minor. On Long Island, very heavy fruit losses took place in Suffolk County, with considerable damage to cauliflower, corn, potatoes and lima beans; by comparison, crop damage in Nassau and Westchester Counties was quite light. In summary, crop losses may be estimated as follows: New York State (principally Suffolk County), $1,000,000; Connecticut, $3,000,000; Rhode Island, $1,000,000; Massachusetts, $5,000,000; New Hampshire, $2,000,000; Maine, $10,000,000; and Vermont, $250,000, for a total of $22,250,000. Thus, an aggregate of $460,550,000 is reached for all forms of property damage and crop losses.

Fatalaties and Injuries

Press reports of the number of deaths caused by "Carol" are various, since some surveys include fatalities only indirectly due to the hurricane. This fact makes it difficult to arrive at an accurate total, but it would appear after cross-checking various lists that approximately sixty fatalities is a reasonable figure for the Long Island-New England area. A like difficulty is encountered with respect to injuries, and it can only be stated that roughly 1000 persons suffered major and minor injuries in the course of the storm.

Track of hurricane CAROL, August 25-31, 1954


Open circles on track indicate locations of center at 7 a.m., e.s.t., of date entered nearby; solid circles show locations of center at 7 p.m.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

AUGUST 1954

Section	Temperature								Precipitation					
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes			
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least
	°F.	°F.		°F.			°F.		In.	In.		In.		In.
Alabama	83.7	3.9	Belle Mina 2N	108	16	Madison	50	10	1.75	-2.80	Calera	4.83	Perryville	0.00
Arizona	76.6	-1.7	Yuma WB AP	117	29	Maverick	28	27	2.00	-.11	Mount Lemmon	9.78	4 Stations	.00
Arkansas	85.3	5.3	3 Stations	111	16+	Bentonville	55	9	1.53	-2.06	Bradford	5.92	2 Stations	.00
California	71.3	-3.2	2 Stations	120	1+	2 Stations	24	16+	.33	.18	Cazadero	7.13	215 Stations	.00
Colorado	66.9	1.0	Holly	108	1	Fraser	18	19	1.55	-.35	Limon 855W	6.94	Idalia	.11
Connecticut	67.1	-1.9	Falls Village	94	1	Falls Village	38	18	6.20	2.06	Westbrook	10.33	Mohauk Ranger Sta.	2.68
Delaware	73.6	-.8	3 Stations	99	1	3 Stations	47	12+	5.11	.27	Wilmington City Hall	7.26	Middletown 25	3.44
Florida	83.4	1.9	DeFuniak Springs	104	12+	3 Stations	60	11+	4.55	-2.53	Longboat Key	12.52	Saint Augustine	.40
Georgia	82.7	2.8	Cartersville	108	27	Blairsville Exp. Sta.	52	12	2.91	-2.32	Valdosta WB AP	6.88	LaFayette	.19
Idaho	64.0	-2.6	Grand View	106	2	4 Stations	22	17+	.91	.33	Fenn RS	4.13	Emmett 2E	.00
Illinois	75.4	.8	Sparta	107	18	Stockton	43	12	5.04	1.68	Fulton Dam 13	11.01	Prairie Du Rocher	2.46
Indiana	73.7	.0	Evansville	103	18	Rushville Sewage Pl	42	12	4.93	1.61	Decatur	8.23	Boonville 2E	2.06
Iowa	72.1	-.5	Indianola	107	4	Saratoga 2E	39	12	7.10	3.34	Malvern 5W	16.13	Sioux City WB AP	1.54
Kansas	81.6	3.3	Minneapolis	112	4	4 Stations	52	9+	3.64	.53	Sabetha Lake	15.74	St. Francis 8NW	.49
Kentucky	77.5	1.7	2 Stations	108	16+	Cynthiana 2	47	13	4.29	.61	Laura	8.76	Kentucky Dam	1.16
Louisiana	83.8	1.5	Urania	108	30	Leesville	57	12	1.86	-2.63	New Orleans Jourdan	5.78	2 Stations	T
Maine	63.3	-1.9	2 Stations	91	16+	West Buxton 2NNW	34	27	5.67	2.40	East Sangerville 55	10.01	Elkworth	3.15
Maryland	73.4	.0	Cheltenham 1NW	104	1	2 Stations	43	8+	5.03	.60	Bittinger 2NW	9.94	Loch Raven Dam	2.23
Massachusetts	66.6	-2.0	Chestnut Hill	96	1	Birch Hill Dam	33	27	5.78	2.09	Fall River	10.94	Winchendon	2.74
Michigan	66.0	-1.1	Wayne	98	23	Gaylord Conservation	30	17	1.87	-1.06	Niles	7.12	Lake City Exp. Farm	.22
Minnesota	66.6	-.6	Canby	99	15	2 Stations	34	11	2.80	-.48	Bricelyn	6.46	Bemidji Airport	.89
Mississippi	84.6	3.7	Columbus	108	9	Houston 2NE	55	10	1.43	-2.61	Pleasant Hill	5.04	2 Stations	.00
Missouri	80.1	3.6	2 Stations	109	16+	2 Stations	50	31	5.06	1.28	Oregon	11.44	West Plains	.81
Montana	64.2	-1.8	Busby	105	31	Jackson	19	27	2.40	1.29	Opheim 1255E	6.98	Pryor	.10
Nebraska	74.4	1.1	Trenton Dam	111	4	Harrison	42	23	4.42	1.70	Wymore	17.76	Harrison 10NE	.66
Nevada	68.6	-2.9	Overton	118	1	Wilkins	23	27	.10	-.40	Searchlight	2.54	34 Stations	.00
New Hampshire	63.2	-2.3	2 Stations	93	25	Fabyan	29	27	4.54	1.01	Fabyan	7.15	West Lebanon	1.30
New Jersey	71.4	-.7	Phillipsburg	104	1	Layton 3NW	36	18	6.79	2.07	Midland Park	9.82	Mays Landing	4.25
New Mexico	71.7	-.3	Jal	105	4+	Eagle Nest	26	27	2.60	.27	Portales	11.25	Jemez Dam	.27
New York	65.6	-1.6	Poughkeepsie	101	1	Speculator	25	27	4.41	.80	Riverhead Research	12.42	Addison	1.24
North Carolina	78.0	1.7	2 Stations	106	5+	Banner Elk	40	13	3.97	-1.56	Gatesville	9.66	Lenoir	.56
North Dakota	66.4	-.6	Watford City 145	102	31	2 Stations	36	10+	2.74	.67	Dickinson Exp Sta	6.82	Oakes	.88
Ohio	71.3	-.4	Portsmouth	99	1	Kenton 2W	40	12	4.85	1.52	Higginsport	10.76	Painesville 2N	1.81
Oklahoma	86.5	4.6	Jay	112	13	Taloga	53	9	1.84	-1.08	Enid	5.83	2 Stations	T
Oregon	61.3	-4.3	Huntington	103	1	2 Stations	22	8+	1.11	.67	Estacada 25E	3.98	P Ranch Refuge	T
Pennsylvania	68.9	-1.3	Wellsville	104	1	Kane 1NNE	32	18	5.33	1.26	Blairsville 6ENE	10.26	Tionesta 25E Dam	1.59
Rhode Island	66.9	-2.3	2 Stations	87	16+	Kingston	44	22	9.02	5.18	Kingston	9.77	Austin	8.05
South Carolina	82.0	3.1	4 Stations	107	17+	2 Stations	55	12+	2.50	-3.17	Tilghman Forest Nrsy	6.44	Sullivans Island	.14
South Dakota	71.4	.3	Ardmore	107	31	Deerfield Dam	32	2+	2.21	.09	Platte	6.41	Edgemont 10N	.05
Tennessee	80.2	3.4	Murfreesboro	109	16	2 Stations	48	31	2.46	-1.46	Lewis Chapel	9.69	Leapwood	.38
Texas	84.3	2.1	Boquillas Ranger Sta	112	13	Mount Locke	51	6+	1.43	-.92	Cornudas Service Sta	5.74	Several stations	.00
Utah	68.6	-1.3	2 Stations	107	1+	Strawberry Junction	24	19	.57	-.55	Ephraim Hdqs G8RC	1.98	Callao	.00
Vermont	62.9	-2.4	2 Stations	94	1+	West Burke	30	28	3.77	.26	Bloomfield	7.13	White River Junction	1.55
Virginia	74.7	.7	4 Stations	104	1+	Monterey	40	13	3.85	-.61	Diamond Springs	7.87	Somerset	.65
Washington	62.2	-3.8	Richland	103	2	2 Stations	30	4+	1.68	.97	Willapa Harbor	5.40	2 Stations	T
West Virginia	71.5	-.3	Williamson	100	17	Canaan Valley	37	8	6.74	2.65	Lake Lynn	12.72	Bluefield	1.97
Wisconsin	66.4	-1.0	3 Stations	95	23+	Long Lake Dam	29	17	2.92	-.52	Reedsburg 35	6.60	Kewaunee	.53
Wyoming	65.3	.7	Devils Tower	106	31	Bondurant	16	18	.82	-.23	La Grange	3.24	2 Stations	.00
Puerto Rico	79.1	.4	Dos Bocas Dam	100	16	Garzas Dam	55	17	7.44	.21	Rio Blanco, (1800 ft. Elev.)	18.52	Yauco	1.66

+ And also on a later date or dates.

Note: Dates in Table 1 apply to the period 24 hours prior to time of observation. In some cases the actual occurrence is on the calendar date preceding that shown. (See individual Climatological Data for times of observations).

Table 2

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
ALABAMA																																
Birmingham	610	992.2	1016.8	96	72	83.6	4.5	101	4	61	31	29	0	67	63	2.74	-1.81	1.18	10	11	0.0	0	5.5	NE	43	SE	19	11	16	4	4.3	76
Mobile	211	1009.8	1017.5	96	74	84.6	3.8	102	30	70	15+	30	0	72	73	3.92	-2.39	1.76	5	9	.0	0	8.4	SW	--	---	--	16	13	2	3.4	--
Montgomery CO	201	------	------	97	74	85.9	4.7	103	14+	69	11	31	0	--	--	1.35	-2.68	.78	6	11	.0	0	----	---	--	---	--	--	--	--	----	--
Montgomery	198	1009.1	1016.5	99	73	85.9	5.0	104	28+	66	11	31	0	69	65	1.68	-3.07	.64	6	9	.0	0	6.3	NE	32	NE	20+	15	14	2	3.9	89
ARIZONA																																
Flagstaff	6933	------	------	77	47	61.6	-1.8	88	1	38	27	0	0	--	--	1.53	-1.07	.98	9	13	.0	0	----	---	--	---	--	11	13	7	4.6	--
Phoenix	1114	972.2	1010.2	100	77	88.4	.1	108	29	67	27	31	0	63	45	.55	-.44	.18	5	5	.0	0	6.2	SE	*30	S	1+	22	6	3	2.8	96
Prescott	5014	849.0	1013.2	85	58	71.6	-2.3	96	29	50	27	6	0	--	--	3.25	-.45	1.91	11	17	T	T	6.6	SSW	30	NW	2	14	12	5	4.2	78
Tucson	2558	925.2	1011.1	95	72	83.4	-.4	105	29	64	27	28	0	58	47	2.00	-.15	.72	10	15	.0	0	6.9	ESE	33	SW	3	11	12	8	4.8	83
Winslow	4880	853.0	1010.9	90	61	75.3	.3	100	2	49	27	16	0	47	41	.60	-1.02	.58	2	7	.0	0	9.0	WSW	*32	W	1	17	8	6	3.8	--
Yuma	199	1003.7	1008.8	105	76	90.8	-2.9	117	29	66	26	31	0	56	36	.02	-.48	.02	1	1	.0	0	11.0	SSE	54	S	1	27	4	0	1.4	96
ARKANSAS																																
Fort Smith	458	998.3	1014.3	100	73	86.7	4.6	107	7+	66	2+	30	0	64	53	2.02	-.60	1.27	5	5	.0	0	7.5	NE	42	NE	28	20	10	1	2.8	90
Little Rock	257	1002.4	1015.0	100	74	87.2	5.9	106	11	69	31	31	0	66	52	.33	-2.82	.18	3	4	.0	0	8.7	SSW	40	S	8	17	11	3	3.4	85
Texarkana	361	1002.4	1015.4	100	74	87.2	4.5	106	30	70	10	31	0	67	55	.16	-2.72	.13	2	5	.0	0	----	---	--	---	--	20	8	3	3.1	--
CALIFORNIA																																
Bakersfield	489	994.9	1012.7	92	62	77.2	-4.6	103	3	54	26	21	0	49	40	.00	-.01	.00	0	0	.0	0	6.4	NW	*19	NW	12	27	2	2	1.1	--
Bishop	4108	872.3	1011.2	93	49	71.2	-2.3	103	1	40	15	25	0	--	--	.00	-.14	.00	0	1	.0	0	----	---	--	---	--	25	3	3	1.6	--
Blue Canyon	5280	840.5	1013.2	72	53	62.2	-5.1	86	1	39	26	0	0	--	--	.38	.33	.38	1	0	.0	0	----	---	--	---	--	24	4	3	1.8	--
Burbank	699	987.8	1014.0	84	62	72.7	-.9	102	30	55	15+	4	0	57	65	T	-.02	T	0	0	.0	0	5.8	S	*17	WNW	30	16	13	2	3.8	--
Eureka CO	43	1014.9	1017.3	61	53	56.7	-.3	70	27	49	1	0	0	--	--	1.24	1.13	.88	8	0	.0	0	5.5	---	25	SW	26	2	10	19	7.7	34
Fresno	331	1000.7	1012.2	91	58	74.5	-5.0	100	9	53	13+	22	0	50	46	.00	.00	.00	0	0	.0	0	6.1	NW	23	NW	19	28	0	3	1.2	98
Los Angeles CO	312	------	------	82	65	73.1	.2	95	31	60	15+	3	0	59	68	T	-.02	T	0	1	.0	0	5.6	---	18	W	29	12	17	2	3.9	71
Los Angeles	99	1010.5	1014.1	78	64	70.9	2.7	89	31	60	15+	0	0	59	72	.04	.02	.04	1	1	.0	0	7.0	WSW	%24	W	30	8	20	3	4.7	--
Mt. Shasta	3543	892.3	1014.8	76	46	61.4	-4.4	94	1	38	15	2	0	--	--	2.47	2.34	1.86	6	1	.0	0	----	---	--	---	--	20	3	8	3.2	--
Oakland	3	1015.6	1015.8	69	55	61.9	-1.0	81	31	49	3	0	0	53	78	.08	.06	.07	3	0	.0	0	8.9	WSW	*21	W	13+	12	9	10	4.9	--
Red Bluff	341	1000.0	1012.6	89	61	75.0	-5.5	103	1	55	13+	17	0	47	43	1.23	1.18	.96	4	1	.0	0	8.3	SSE	24	SE	23	25	2	4	1.7	87
Sacramento	17	1011.9	1012.8	85	55	70.2	-3.0	94	6+	51	15	12	0	51	58	.34	.34	.34	2	0	.0	0	10.2	SSW	38	SW	19	25	3	3	1.8	87
Sandberg CO	4517	863.5	1012.5	81	57	68.5	-5.0	96	31	42	26	3	0	--	--	.00	-.10	.00	0	0	.0	0	----	---	--	---	--	28	1	2	1.2	--
San Diego	19	1010.5	1013.7	77	65	71.0	.7	88	30	60	14	0	0	60	70	T	-.05	T	0	0	.0	0	6.1	WNW	17	SW	12+	12	15	4	4.1	64
San Francisco CO	52	------	------	62	53	57.9	-1.4	73	31	50	1+	0	0	--	--	.20	.19	.10	4	0	.0	0	11.0	---	29	W	24	11	6	14	5.8	52
San Francisco	1	1014.6	1015.3	70	53	61.1	.5	77	31	45	3	0	0	53	82	.01	.00	.01	1	0	.0	0	13.6	W	33	W	3	17	6	8	4.5	--
Santa Maria	231	1006.8	1015.5	71	52	61.8	-.6	78	28+	46	16+	0	0	53	78	T	-.03	T	0	0	.0	0	6.4	W	*21	W	14+	10	17	4	4.0	--
COLORADO																																
Alamosa	7534	776.8	1018.8	80	44	61.5	-.3	86	2+	33	19+	0	0	--	--	1.03	-.07	.29	11	8	.0	0	----	---	--	---	--	12	15	4	4.6	--
Colorado Springs	6173	814.1	1013.9	85	55	70.3	.6	99	3	45	7	6	0	46	49	1.98	-.71	.91	9	11	T	T	10.1	NNW	*40	WSW	20+	15	11	5	3.9	--
Denver	5292	839.5	1012.3	87	59	72.7	1.4	97	3	53	8+	12	0	43	42	.51	-.92	.32	5	4	.0	0	10.2	S	35	NW	16	14	8	9	4.7	77
Grand Junction	4849	859.8	1012.4	88	61	74.5	-1.1	98	2	55	18+	14	0	38	32	.59	-.61	.26	6	6	T	T	9.7	ESE	43	SE	20	16	10	5	3.6	78
Pueblo	4639	857.8	1012.8	90	60	74.9	1.6	101	3	55	8+	19	0	50	48	.80	-.98	.56	7	12	.0	0	7.6	SE	46	W	13	15	7	9	4.5	79
CONNECTICUT																																
Bridgeport	7	1013.5	------	79	62	70.4	-1.3	88	16	55	27+	0	0	--	--	4.86	.43	1.62	10	2	.0	0	----	---	--	---	--	7	10	14	6.1	--
Hartford	169	------	------	78	58	67.7	---	89	1	45	27	0	0	59	74	4.54	----	2.10	12	3	.0	0	8.6	SW	56	NE	31	4	14	13	6.7	57
New Haven	6	1009.8	1013.5	77	60	68.9	-.9	86	1	53	27	0	0	--	--	5.82	1.71	2.74	12	3	.0	0	6.9	---	38	NE	31	5	13	13	6.4	59
DELAWARE																																
Wilmington	73	1011.5	1014.8	82	63	72.9	-.9	93	19	54	18	4	0	62	72	5.82	.54	2.05	10	6	.0	0	7.3	NW	--	---	--	9	12	10	6.0	--
DISTRICT OF COLUMBIA																																
Washington CO	72	------	------	84	67	75.6	-.2	95	16	59	14	5	0	--	--	3.73	-.76	.83	12	5	.0	0	6.8	---	29	NW	16	--	--	--	---	--
Wash. Nat'l. AP	14	1011.2	1015.5	84	67	75.2	-.2	94	16+	58	14	5	0	62	68	3.15	-1.60	.92	11	5	.0	0	9.4	NW	38	NW	16	10	12	9	5.4	65
FLORIDA																																
Apalachicola CO	13	1014.9	1015.9	90	77	83.7	2.4	94	29+	73	13	19	0	--	--	2.84	-4.64	.92	8	15	.0	0	7.0	---	36	NE	21	10	11	2	3.3	83
Daytona Beach	31	1015.2	1016.8	92	73	82.3	1.4	96	30+	70	20+	23	0	74	82	3.04	-2.78	.94	7	14	.0	0	8.5	ENE	*22	ENE	21	10	17	4	4.7	--
Fort Myers	15	1015.9	1016.5	92	74	83.2	.7	96	5	70	12	30	0	75	82	6.84	-.97	2.30	17	25	.0	0	6.1	E	*32	N	18	6	17	8	5.7	--
Jacksonville CO	18	------	------	94	75	84.8	3.3	99	17+	70	16	28	0	--	--	2.50	-3.76	.68	11	--	T	0	----	---	--	---	--	--	--	--	---	--
Jacksonville	24	1016.6	1016.7	96	74	84.9	3.1	102	17+	67	16	30	0	72	72	4.06	-2.37	1.61	9	8	.0	0	8.8	WSW	35	N	29+	13	14	4	4.4	66
Key West CO	9	1014.9	1015.6	92	76	84.6	.7	95	10	73	31	27	0	--	--	5.12	.45	1.39	16	14	.0	0	6.0	---	23	NE	24	4	15	12	6.7	62
Lakeland CO	214	------	------	92	74	83.1	1.4	97	18	70	14+	23	0	--	--	5.55	-1.58	2.17	14	21	.0	0	5.6	---	--	---	--	3	22	6	6.0	56
Miami CO	8	------	------	89	78	83.2	1.1	94	27	72	31+	12	0	--	--	3.09	-1.97	1.05	9	11	.0	0	9.1	E	36	E	24	6	21	4	5.1	79
Miami	8	1014.9	1015.9	93	77	84.9	2.0	98	6	73	31	28	0	74	73	1.65	-4.96	.62	10	12	.0	0	7.2	SE	*20	SW	29	5	19	7	6.0	--
Miami Beach	9	------	------	89	80	84.3	1.3	96	27	74	29	12	0	--	--	4.78	.39	3.24	13	--	.0	0	----	---	--	---	--	11	15	5	---	--
Orlando	106	1012.5	1016.7	93	74	83.5	1.0	96	27+	72	15+	31	0	74	80	4.39	-2.48	1.83	11	15	.0	0	7.5	ENE	*28	W	2	9	21	1	4.7	--
Pensacola CO	13	1014.2	------	93	77	84.7	3.5	99	31+	70	21	26	0	--	--	.63	-6.80	.50	6	8	.0	0	----	---	24	SE	13	--	--	--	---	83
Pensacola CAA AP	118	------	1016.5	---	--	----	---	---	--	--	--	--	--	74	--	----	----	----	--	--	---	--	7.2	SW	--	---	--	--	--	--	---	--
Tallahassee	64	1013.9	1016.4	95	73	83.9	3.0	99	12	69	21+	30	0	72	75	3.26	-3.66	1.20	11	14	.0	0	4.1	SW	--	---	--	15	13	3	4.0	--
Tampa	19	1015.2	1016.6	91	74	82.5	.5	94	20	71	31+	21	0	75	81	4.73	-3.33	1.77	16	23	T	0	6.5	W	*35	E	21+	4	21	6	5.6	76
West Palm Beach	15	1014.9	1015.8	92	76	83.9	1.7	96	28	71	31	26	0	75	77	3.62	-3.78	.64	16	15	.0	0	9.3	ESE	*44	WNW	29	8	15	8	5.8	--
GEORGIA																																
Atlanta	977	977.0	1017.3	94	71	82.5	3.9	102	16	65	31	26	0	67	65	1.14	-2.67	.45	5	9	.0	0	7.5	NW	48	N	28	10	16	5	4.5	76
Athens	798	988.2	------	95	69	81.8	2.1	105	17	64	10	25	0	--	--	2.44	-1.54	.76	7	7	T	0	----	---	--	---	--	15	12	4	4.0	--
Augusta	143	1009.5	1015.9	96	69	82.3	1.6	103	17+	64	31+	30	0	69	70	3.60	-.50	.90	8	10	.0	0	5.3	NNW	*42	NW	28	15	14	2	3.8	--
Columbus	385	1002.7	1016.6	95	70	82.9	2.7	100	28+	63	11	31	0	--	--	2.30	-2.63	1.10	9	9	.0	0	----	---	--	---	--	16	10	5	3.7	--
Macon	356	1002.7	1015.7	98	71	84.6	2.9	104	16	65	12+	30	0	67	62	2.07	-2.57	1.19	5	11	.0	0	5.8	NNW	43	SW	28	17	11	3	3.6	85
Rome	637	994.2	1016.9	94	68	81.1	2.3	101	16	60	11	27	0	--	--	2.40	-1.49	.71	11	11	.0	0	----	---	--	---	--	9	17	5	4.9	--
Savannah	48	1013.5	1016.1	96	71	83.8	2.9	104	5	68	20	30	0	69	68	1.33	-4.92	.55	6	12	.0	0	8.1	NNE	58	N	17	13	16	2	3.9	84
IDAHO																																
Boise	2842	917.7	1012.0	83	54	68.2	-4.3	98	2	41	25	9	0	41	40	.24	.03	.16	3	3	.0	0	9.2	NW	35	NW	24	13	11	7	4.3	91
Idaho Falls 46W CO	4933	848.3	1013.2	83	45	63.8	-1.5	99	2	28	27	7	1	--	--	.39	-.41	.21	4	3	.0	0	9.7	---	a30	WSW	31	--	--	--	---	--
Idaho Falls 43NW CO	4780	------	------	84	46	65.2	-.1	99	2	31	22+	7	2	--	--	.30	-.50	.17	5	2	.0	--	8.2	---	a28	SSW	3	--	--	--	---	--
Lewiston	1413	962.4	1013.4	81	52	66.8	-6.3	97	1	44	25+	5	0	--	--	1.23	.85	.45	9	5	T	T	----	---	--	---	--	11	5	15	5.4	--
Pocatello	4444	862.9	1012.2	84	51	67.8	-2.3	100	2	35	27	6	0	35	34	.44	-.28	.18	5	5	T	T	11.7	SW	34	SE	10	14	13	4	3.8	77
ILLINOIS																																
Cairo CO	314	1002.4	------	93	73	82.9	3.4	103	15	63	31	21	0	--	--	4.52	1.31	1.56	10	8	.0	0	6.7	---	44	NW	25	7	16	[illegible]	5.3	74
Chicago	610	993.6	1016.1	82	65	73.3	.6	95	23	55	12	4	0	62	71	5.91	2.72	1.80	11	8	T	0	7.5	E	[illegible]	NW	16	5	14	[illegible]	6.4	59
Moline	589	994.6	1016.6	81	63	72.0	-1.0	94	23	53	31	3	0	65	79	6.67	3.10	2.32	13	12	T	T	6.0	E	40	E	4	8	7	16	6.4	61
Peoria	654	993.9	1016.2	83	65	73.8	.1	93	15+	54	31	6	0	66	75	8.56	5.57	3.26	15	12	T	T	7.5	---	43	NW	4	9	9	13	6.2	64
Springfield	587	992.9	1015.8	85	66	75.2	1.2	96	4	53	31	10	0	66	77	4.54	1.51	1.51	16	12	.0	0	8.9	E	50	W	18	9	7	15	6.2	67
INDIANA																																
Evansville	383	1001.4	1016.8	89	68	70.6	2.3	99	18	56	31	17	0	68	73	4.22	1.18	2.01	13	10	.0	0	6.7	SSW	34	N	4	9	10	12	5.6	68
Fort Wayne	801	985.1	1016.1	82	61	71.1	-.3	94	23	48	12	3	0	62	76	5.61	2.81	2.43	14	9	.0	0	8.7	NW	43	SW	19	5	14	12	6.2	59

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)				
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
INDIANA (Cont'd.)																																
Indianapolis	793	987.5	1016.7	84	64	73.6	-.4	94	23	52	12	9	0	64	76	2.73	-0.79	0.47	15	13	0.0	0	8.8	NE	37	NW	18	7	12	12	6.1	77
South Bend	768	988.8	1016.6	79	60	69.3	-2.1	92	23	49	12	1	0	62	80	5.10	1.85	1.97	11	7	.0	0	8.1	NNW	*38	WNW	24	5	14	12	6.6	--
IOWA																																
Burlington	694	990.9	1016.4	83	65	74.1	-.3	99	4	55	31	8	0	65	78	5.24	1.93	2.00	13	15	.0	0	8.1	E	40	NW	4	8	10	13	6.2	72
Des Moines	948	985.4	1016.2	83	64	73.5	-.3	102	4	57	3	4	0	65	80	10.47	6.71	3.04	16	13	T	T	9.8	ESE	45	W	16	6	9	16	6.5	58
Dubuque	1065	978.3	1017.2	79	59	69.0	-1.7	88	23	49	12	0	0	62	76	4.28	.68	1.04	12	11	T	T	----	---	--	---	--	4	13	14	6.7	--
Sioux City	1094	973.9	1014.6	83	64	73.3	-.3	93	15	55	31	4	0	64	77	1.54	-1.18	.50	8	7	.0	0	7.9	SE	34	SE	4	10	8	13	6.1	60
KANSAS																																
Concordia CO	1375	964.1	------	91	69	79.7	1.2	106	3+	60	8	17	0	--	68	6.69	3.49	1.85	15	20	T	T	7.6	---	29	NW	8	15	6	10	4.8	58
Dodge City	2594	926.2	1011.3	94	68	81.1	2.5	103	16	58	8	23	0	60	56	2.18	-.50	1.38	9	12	.0	0	14.5	S	47	SE	20	17	10	4	3.7	81
Goodland	3645	887.9	1011.9	91	61	75.9	2.0	105	3	55	8+	20	0	56	58	1.77	-.78	.82	6	12	T	T	10.0	S	*28	WSW	20	14	11	6	4.5	--
Topeka	879	970.7	1013.7	92	69	80.9	3.3	103	4+	62	2	20	0	67	67	6.58	1.92	2.39	13	13	.0	0	10.6	E	56	E	1	11	11	9	5.4	56
Wichita	1321	965.1	1012.3	98	73	85.6	5.7	105	5+	64	8	29	0	62	51	.96	-2.00	.63	7	11	.0	0	14.0	S	40	N	1	12	15	4	4.4	83
KENTUCKY																																
Lexington	979	981.4	1016.5	87	66	76.4	2.0	97	24	55	31+	9	0	66	75	3.29	-.08	1.21	12	13	T	T	8.9	SSW	--	---	--	5	14	12	6.2	--
Louisville CO	457	------	------	87	69	77.9	1.0	97	18	59	31	12	0	--	--	5.26	1.95	1.52	12	8	T	0	----	---	--	---	--	--	--	--	---	--
Louisville	474	999.3	1015.5	88	67	77.8	1.7	98	18	57	31	15	0	67	72	4.51	1.45	1.78	13	9	T	0	6.6	S	36	NW	26	8	9	14	6.3	58
LOUISIANA																																
Baton Rouge	64	1013.5	1016.4	94	73	83.1	2.4	102	30	68	12	28	0	72	75	1.55	-4.32	.46	9	12	.0	0	6.0	WSW	--	---	--	12	15	4	4.6	--
Lake Charles	12	1014.9	1016.3	93	74	83.1	.8	99	30	68	12	24	0	72	76	2.43	-2.23	.71	8	9	.0	0	6.4	S	*30	NNE	29	7	18	6	5.1	--
New Orleans CO	9	1014.6	------	93	78	85.2	1.8	98	30	70	15	30	0	--	--	4.05	-2.36	3.00	8	12	.0	0	5.2	---	30	NE	15	11	18	2	4.6	76
New Orleans	3	1015.2	1016.5	92	74	82.8	.6	96	11+	70	1+	28	0	73	77	5.40	-.24	1.69	6	11	.0	0	6.8	SW	*33	E	15	10	17	4	4.5	--
Shreveport	252	1006.1	1015.5	100	74	86.9	3.1	105	30	69	13	31	0	71	64	.92	-1.45	.53	3	6	.0	0	9.2	SSW	--	---	--	20	10	1	3.0	84
MAINE																																
Caribou	624	988.2	1011.3	70	49	59.4	-2.4	81	25	38	27	0	0	53	80	6.30	2.77	2.15	18	5	.0	0	9.4	WSW	*42	ENE	31	7	8	16	6.6	--
Portland	61	1008.8	1012.7	75	52	63.9	-2.5	88	25	40	29+	0	0	57	79	4.79	2.20	2.26	10	2	.0	0	8.2	W	69	E	31	4	14	13	6.6	59
MARYLAND																																
Baltimore CO	14	------	------	84	69	76.3	-.1	93	16	64	22+	4	0	--	--	4.34	-.04	1.36	12	--	---	--	----	---	--	---	--	--	--	--	---	--
Baltimore	146	1011.2	1015.7	82	64	73.2	-1.2	93	19+	53	14	4	0	62	70	4.10	-.28	.81	12	6	.0	0	8.7	WNW	50	NW	16	9	12	10	5.9	63
Frederick	294	------	------	82	62	72.2	-2.4	93	16	51	14	4	0	--	--	5.59	1.56	1.29	13	4	.0	0	----	---	--	---	--	--	--	--	---	--
MASSACHUSETTS																																
Blue Hill Obs.	636	990.6	1013.7	76	58	65.8	-1.7	88	25	47	27	0	0	--	76	5.49	1.42	2.46	13	5	.0	0	14.2	W	93	SE	31	7	11	13	6.3	52
Boston	15	1008.8	1013.3	78	62	70.1	-1.4	92	25	52	27	2	0	58	68	5.64	2.41	2.60	11	3	T	T	12.0	SW	*86	SE	31	7	11	13	6.4	67
Nantucket	43	1013.5	1013.9	74	60	66.8	-.3	80	26+	51	29	0	0	61	83	4.80	1.37	1.89	11	3	.0	0	12.8	WSW	72	SE	31	8	9	14	6.1	70
Pittsfield	1153	971.2	1013.2	73	53	62.7	-3.1	84	16	40	27	0	0	--	--	3.90	-.41	2.08	13	4	.0	0	----	---	--	---	--	--	--	--	---	--
MICHIGAN																																
Alpena CO	587	994.6	------	73	56	64.6	-1.2	87	23	46	17+	0	0	--	--	2.06	-.53	.84	12	7	.0	0	9.4	---	30	NW	11	6	14	11	5.8	67
Detroit	619	989.5	1016.0	80	60	70.3	-1.0	93	23	52	17	2	0	58	67	2.07	-.55	1.05	9	4	T	T	8.7	W	44	NW	25	6	13	12	6.2	74
Detroit (Willow Run)	722	987.8	1015.9	81	60	70.1	-1.0	94	23	50	11	3	0	57	69	1.15	-1.56	.34	10	4	.0	0	9.0	NW	*26	ESE	20	5	15	11	6.2	--
East Lansing CD	859	984.8	------	80	58	69.1	.1	94	23	48	17	2	0	--	--	1.43	-1.25	.39	7	4	.0	0	4.0	---	14	NW	10+	10	13	8	5.4	62
Escanaba CO	594	993.9	------	73	55	64.0	-.9	86	15+	45	17	0	0	--	--	2.17	-.72	1.28	10	5	.0	0	9.3	---	33	N	16	9	14	8	5.4	68
Grand Rapids	681	991.2	1016.2	79	58	68.4	-1.3	94	23	45	12	1	0	58	73	1.80	-.70	.80	11	5	.0	0	6.9	W	26	SW	25	6	12	13	6.2	63
Marquette CO	677	989.2	------	72	57	64.5	-.8	89	24	50	17	0	0	--	70	2.28	-.43	1.08	8	3	.0	0	7.1	---	20	SW	23	7	10	14	6.4	66
Mukegon	627	993.2	1016.5	77	58	67.5	-.9	87	23	44	17	0	0	60	74	2.50	-.16	.85	9	5	.0	0	----	---	--	---	--	10	13	8	5.3	--
Sault Ste. Marie	721	994.2	1016.3	72	52	62.0	-.9	85	24	39	27	0	0	55	81	.75	-1.87	.26	8	2	.0	0	7.8	WNW	27	NW	11	11	8	12	5.9	55
MINNESOTA																																
Duluth	1409	975.3	1016.7	74	53	63.3	-1.5	86	24	42	11+	0	0	55	77	1.38	-2.05	.49	9	6	.0	0	10.2	NW	26	E	25	6	16	9	6.3	62
Intern'l Falls	1179	973.2	1016.3	73	49	61.3	-1.5	89	24	34	11	0	0	54	77	1.78	-1.54	.75	10	5	.0	0	7.7	---	--	---	--	5	10	16	6.8	--
Minneapolis	830	983.4	1016.5	81	60	70.4	-1.1	90	15+	52	11	2	0	58	69	3.08	.29	1.44	8	6	.0	0	9.1	SE	*40	NNW	15	11	13	7	5.0	61
Rochester	1017	979.7	1016.5	79	57	67.8	-1.6	90	15	45	31	1	0	57	69	3.77	.29	1.11	9	8	.0	0	6.2	SE	--	---	--	6	14	11	6.3	--
St. Cloud	1034	978.3	1016.0	78	55	66.4	-1.7	88	24	46	11	0	0	58	75	2.94	.06	1.74	7	8	.0	0	4.9	SE	--	---	--	7	18	6	5.3	--
MISSISSIPPI																																
Jackson	315	1004.7	1016.3	99	73	86.0	4.6	105	14	65	11+	31	0	68	61	2.17	-1.11	2.06	4	7	.0	0	5.9	SW	32	SW	20	17	13	1	3.2	84
Meridian	294	1002.4	------	99	71	84.5	4.0	103	16+	60	11	31	0	--	--	1.28	-2.44	.75	5	6	.0	0	----	---	--	---	--	19	12	0	3.2	--
Vicksburg CO	234	1007.8	------	96	78	85.5	4.0	100	30+	71	31+	31	0	--	--	1.39	-1.32	.67	5	6	.0	0	7.6	---	25	E	23	17	13	1	3.4	74
MISSOURI																																
Columbia	778	987.1	1014.9	90	69	79.4	3.2	101	4+	58	31	20	0	66	67	6.55	2.66	1.54	15	16	.0	0	8.5	ESE	56	NW	29	12	9	10	5.1	66
Kansas City	741	980.4	1014.3	91	72	81.5	2.5	103	4+	64	1+	18	0	66	64	5.01	1.12	1.71	12	12	T	0	10.1	NE	45	NW	1	10	12	9	5.0	72
St. Joseph	809	------	------	87	69	78.1	.0	100	4	63	31	14	0	--	--	10.35	6.62	1.72	13	14	.0	0	----	---	--	---	--	--	--	--	---	--
St. Louis CO	465	995.3	------	89	72	80.0	1.4	101	4	60	12	16	0	--	--	3.93	.16	1.33	14	11	.0	0	9.5	---	34	NW	18	7	10	14	6.1	55
St. Louis	552	995.3	1015.6	90	70	80.0	2.3	103	18	58	31	18	0	66	66	4.56	1.01	1.03	14	11	.0	0	8.0	ESE	--	---	--	8	11	12	5.7	--
Springfield	1265	968.5	1015.0	94	69	81.7	5.2	102	17	59	31	24	0	64	60	2.84	-1.17	.72	11	9	.0	0	12.4	S	59	W	19	9	16	6	4.9	79
MONTANA																																
Billings	3568	891.0	1011.9	85	55	69.7	-1.3	100	30	47	18	7	0	48	50	.76	-.12	.24	8	11	T	T	9.9	SW	56	NW	15	10	17	4	4.4	78
Glasgow CO	2090	939.7	1013.1	82	56	68.8	-.8	97	30	46	28	2	0	53	63	4.88	3.53	1.42	11	14	.0	0	----	---	--	---	--	9	12	10	5.2	--
Great Falls	3664	888.3	1013.4	77	53	65.1	-2.0	93	9	46	28	2	0	44	53	2.63	1.43	1.20	15	17	T	T	11.6	WSW	71	SW	9	8	14	9	5.6	69
Havre CO	2488	925.5	1013.2	79	55	67.2	-.8	93	30	44	28	2	0	--	--	3.03	1.97	1.15	15	14	T	T	7.6	---	40	SW	30	13	9	9	5.2	57
Helena	3893	873.7	1013.5	79	49	64.0	-1.8	93	30	38	27	4	0	44	54	1.35	.42	.49	10	18	T	T	7.1	W	38	SW	26	8	16	7	5.6	65
Kalispell	2965	------	------	75	46	60.8	-3.2	87	8	37	4	0	0	--	--	3.04	1.93	1.03	15	12	.0	0	----	---	--	---	--	10	5	16	5.7	--
Miles City	2629	929.9	1012.7	87	57	71.9	-.4	100	30	48	18	13	0	54	--	2.40	1.30	.68	12	12	.0	0	9.2	SE	--	---	--	15	11	5	4.0	--
Missoula	3200	902.1	1015.4	77	47	62.1	-4.0	90	2+	38	25+	3	0	44	58	1.14	.36	.33	13	11	T	T	5.7	NW	56	SW	13	7	12	12	6.2	64
NEBRASKA																																
Grand Island	1841	948.5	1013.5	84	66	74.8	-1.4	102	3	56	8	9	0	65	76	6.40	4.01	2.46	10	14	.0	0	11.3	ENE	--	---	--	12	9	10	5.2	--
Lincoln CD	1184	------	------	84	67	75.6	-1.3	104	4	59	8	7	0	--	--	10.14	7.06	2.64	17	19	T	0	7.7	---	36	W	15	9	9	13	5.9	62
Norfolk	1544	959.4	1014.2	84	64	73.6	-.3	98	15	54	8	8	0	64	74	1.57	-1.30	.48	11	12	.0	0	----	---	--	---	--	11	5	15	6.0	--
North Platte	2779	915.7	1012.2	87	61	73.6	-.1	105	3	48	8	12	0	62	72	2.06	-.05	.57	12	12	.0	0	11.9	ESE	49	NW	29	10	12	9	4.9	62
Omaha	978	975.3	1014.6	86	67	76.3	.6	105	4	59	31	9	0	66	75	6.84	3.72	1.46	18	13	.0	0	10.4	SE	45	W	15	9	9	13	5.7	45
Scottsbluff	3950	879.4	1012.1	88	58	72.9	.5	101	3	51	21+	13	0	55	61	1.33	.11	.75	8	9	T	T	8.0	ESE	--	---	--	14	11	6	4.3	--
Valentine CO	2581	923.1	------	85	61	72.7	-.4	98	15	54	2+	7	0	--	--	3.42	1.42	1.00	15	12	T	T	8.1	---	31	S	15+	10	10	11	5.4	68
NEVADA																																
Elko	5075	844.9	1013.0	85	43	64.0	-3.6	99	2	31	22	9	2	33	33	T	-.29	T	0	1	.0	0	6.0	SW	*26	SW	19	19	10	2	2.5	--
Ely	6257	810.4	1013.3	83	45	64.0	-2.3	95	2	33	17	5	0	33	35	.05	-.84	.03	2	2	.0	0	13.0	---	57	E	30	15	13	3	3.1	86
Las Vegas	2162	944.8	1008.7	101	71	86.0	-2.4	110	1	63	18	31	0	34	18	.28	-.25	.20	2	3	.0	0	13.6	SW	*49	SE	9	26	4	1	1.5	87
Reno	4397	862.2	1013.9	85	42	63.6	-3.8	99	1	35	15	7	0	33	37	T	-.23	T	0	0	.0	0	7.0	WNW	33	W	25	23	6	2	1.6	96
Winnemucca	4299	866.9	1013.0	86	44	64.6	-5.1	100	1+	30	27	11	1	27	26	T	-.18	T	0	0	.0	0	8.5	---	35	W	24	22	7	2	2.5	89

See footnotes at end of table.

CLIMATOLOGICAL DATA

Table 2—Continued

AUGUST 1954

State and station	Elevation (ground)	Pressure		Temperature										Average dew point	Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below			Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
NEW HAMPSHIRE																																
Concord	339	1002.7	1013.2	77	52	64.4	-2.1	91	25	36	27	1	0	55	74	4.81	1.71	3.56	9	1	0.0	0	5.3	NW	56	E	31	6	9	16	6.7	53
Mt. Washington	6262	806.4	1013.2	49	38	43.4	-4.3	58	25	29	27+	0	6	--	91	11.12	4.97	3.49	22	2	T	T	31.8	W	%142	ENE	31	1	9	21	8.5	22
NEW JERSEY																																
Atlantic City CO	8	1012.2	1013.9	79	66	72.5	-.6	90	1	60	23+	1	0	--	--	4.73	.01	2.98	12	5	.0	0	14.3	---	57	NE	31	9	12	10	5.7	66
Newark	11	1012.9	1014.3	82	63	72.3	-.8	92	16	54	12	3	0	59	65	6.37	2.18	1.90	13	2	.0	0	9.6	SW	*43	WNW	31	6	14	11	6.1	--
Trenton CO	56	1007.1	1013.9	81	63	71.9	-1.3	90	16	57	23+	1	0	--	--	7.04	2.45	2.09	11	4	.0	0	8.1	---	*31	NW	31	6	13	12	6.2	61
NEW MEXICO																																
Albuquerque	5310	850.7	1012.1	90	63	76.6	-.3	98	2	57	21	16	0	50	47	.65	-.73	.26	8	6	.0	0	8.8	SE	40	E	30	14	13	4	4.5	80
Clayton	4969	847.6	1013.5	87	60	73.7	.8	94	1+	55	19	13	0	--	--	2.32	.31	.98	12	12	.0	0	----	---	--	---	--	17	8	6	4.0	--
Roswell	3612	893.7	1012.2	93	65	79.2	1.2	99	1+	62	8+	24	0	57	53	1.61	.16	.70	7	12	.0	0	7.1	---	47	S	24	12	13	6	4.4	--
NEW YORK																																
Albany	277	1010.2	1013.8	78	56	67.0	-2.6	90	16	44	29	1	0	57	74	5.20	2.31	2.91	12	4	.0	0	6.8	S	34	NW	31	3	14	14	6.8	48
Binghamton	1601	956.3	1014.9	75	55	65.2	-1.4	87	24	45	27	0	0	56	78	2.65	-1.01	1.26	12	3	.0	0	9.3	WNW	37	W	11	1	11	19	7.8	47
Buffalo	693	987.5	1015.5	76	58	66.9	-2.0	87	24	47	27	0	0	57	72	2.45	-.09	.65	12	6	T	0	12.7	SW	35	WNW	4	5	9	17	7.0	61
New York CO	10	1002.7	------	79	65	71.7	-1.5	88	16	56	12	0	0	--	--	6.58	2.24	2.08	11	2	.0	0	11.4	---	61	NW	31	8	10	13	6.0	59
New York	19	1012.5	1014.4	82	66	73.5	-.9	91	16	59	27	2	0	60	66	7.86	3.59	2.17	13	4	.0	0	9.0	SW	56	NW	11	7	11	13	6.4	--
Rochester	543	995.6	1014.7	77	57	66.9	-2.0	90	23	45	27	1	0	57	75	3.74	1.26	.91	11	7	.0	0	7.8	WSW	38	W	10	7	11	13	6.5	58
Schenectady	217	------	------	78	58	67.9	-2.5	88	16	46	27	0	0	--	--	3.92	.65	2.25	13	3	.0	0	----	---	--	---	--	17	8	6	3.8	--
Syracuse	424	993.2	1015.1	78	57	67.7	-2.6	90	24	43	27	1	0	57	71	7.19	4.10	4.27	13	3	.0	0	7.7	W	35	NW	16	6	10	15	6.7	55
NORTH CAROLINA																																
Asheville CO	2203	------	------	85	64	74.5	1.8	94	16	56	12	5	0	--	--	1.98	-1.60	.66	10	16	.0	0	5.5	---	29	N	1	7	18	6	5.3	72
Asheville	2093	945.1	1017.4	--	--	----	---	---	--	--	--	--	--	64	81	----	----	----	--	--	---	--	2.8	NNW	--	---	--	--	--	--	---	--
Charlotte	753	989.2	1016.3	93	69	80.8	3.5	102	16	63	31+	24	0	66	67	3.42	-.94	1.70	9	10	.0	0	7.4	SW	54	NW	16	6	20	5	5.2	77
Greensboro	891	985.4	1017.1	88	66	76.8	1.0	98	16	53	12	13	0	66	74	2.95	-1.76	.59	11	12	.0	0	7.0	SW	32	NW	1	8	16	7	5.4	70
Hatteras	4	1014.9	1015.6	86	75	80.1	1.8	91	4	68	13	1	0	71	76	6.93	1.10	5.55	11	9	.0	0	11.9	SSW	78	NW	30	16	10	5	4.3	72
Raleigh	438	1000.3	1016.1	89	66	77.4	.2	97	16+	54	12	13	0	66	75	5.06	.10	1.36	12	11	.0	0	6.8	SW	--	---	--	12	13	6	4.8	68
Wilmington	30	1014.6	1016.0	92	70	80.9	1.6	102	5	61	8	18	0	--	--	3.29	-3.11	2.27	8	8	.0	0	9.0	---	42	N	30	15	13	3	3.7	86
Winston-Salem	967	982.4	1017.0	89	67	77.9	1.7	99	5	57	12	14	0	64	69	1.76	-2.34	.60	11	9	.0	0	7.6	NE	*30	S	9	9	13	9	5.4	--
NORTH DAKOTA																																
Bismarck	1650	955.3	1014.8	81	56	68.2	-1.1	98	31	48	10	2	0	57	70	2.68	1.18	.58	10	9	.0	0	10.2	E	50	S	20	14	11	6	4.6	70
Devils Lake CO	1471	962.4	------	76	54	65.0	-1.8	92	31	45	10+	1	0	--	--	1.68	-.49	.49	10	9	.0	0	7.2	---	25	SE	17	10	9	12	5.5	58
Fargo	895	981.4	1015.5	81	57	68.8	-.3	93	24	44	10	1	0	57	69	2.60	-.13	1.06	9	6	.0	0	11.5	SSE	42	NW	15	10	13	8	5.0	69
Williston CO	1877	947.2	1014.2	79	56	67.2	-.9	93	31	47	19+	2	0	53	63	2.81	1.40	.76	11	8	.0	0	7.8	---	35	SE	20	8	12	11	5.7	63
OHIO																																
Akron	1210	979.0	1016.8	80	58	69.4	-1.2	94	24	49	12	2	0	59	74	4.31	1.05	1.64	9	7	.0	0	8.4	SW	--	---	--	5	17	9	6.2	--
Cincinnati Obs	761	------	------	84	65	74.6	-.2	94	24+	52	13	9	0	--	--	6.54	3.16	2.09	16	12	.0	0	4.6	---	18	W	25	--	--	--	---	63
Cincinnati	869	984.8	1015.5	85	64	74.5	1.0	93	25+	52	13+	9	0	64	74	6.10	2.76	1.70	18	12	.0	0	7.1	SSW	30	SSW	2	6	12	13	6.4	--
Cleveland CO	663	------	------	78	64	70.8	-1.4	94	23	56	18	2	0	--	--	2.13	-.62	.66	9	--	.0	0	----	---	--	---	--	--	--	--	---	--
Cleveland	787	988.8	1016.0	81	61	71.3	-.6	93	23	54	13	2	0	60	71	3.16	.52	1.48	12	7	.0	0	8.5	N	42	NW	16	5	14	12	6.1	50
Columbus CO	724	------	------	82	66	72.9	-.9	93	23	51	12	3	0	--	--	4.28	1.27	1.39	10	--	.0	0	----	---	--	---	--	--	--	--	---	--
Columbus	815	------	1016.4	82	62	72.3	-.1	93	24	47	12	4	0	63	78	5.18	1.97	1.61	14	9	.0	0	5.5	NW	28	NW	16	3	13	15	6.6	66
Dayton	1002	980.4	1016.3	82	63	72.6	-.3	92	24	49	12	3	0	63	77	4.49	1.63	.97	14	10	.0	0	6.1	NW	40	NW	24	6	14	11	6.3	68
Portsmouth CO	715	------	------	82	62	72.3	-1.0	94	16	48	12	4	0	--	--	6.23	2.73	2.32	14	13	.0	0	2.7	---	%45	NNE	5	--	--	--	---	--
Sandusky CO	603	993.9	------	80	65	72.5	-.3	94	24	55	12	2	0	--	--	6.76	3.95	3.30	12	8	.0	0	5.6	---	44	NW	16	8	14	9	5.7	62
Toledo	622	993.2	1016.1	80	60	70.4	-.9	92	23	49	12	2	0	60	75	3.80	1.11	1.15	10	6	.0	0	8.1	SW	44	SW	16	8	13	10	5.8	70
Youngstown	1178	974.3	1016.5	79	57	68.1	-2.3	90	24+	47	18+	2	0	57	74	2.47	-.99	.58	13	7	.0	0	7.5	SW	*32	WNW	10	6	14	11	6.4	--
OKLAHOMA																																
Oklahoma City	1280	971.2	1014.0	99	73	85.9	3.9	103	11+	61	9	30	0	63	51	1.24	-1.26	.75	5	5	.0	0	11.7	SSE	38	NE	2	20	10	1	3.0	83
Tulsa	672	989.8	1013.6	99	75	87.3	5.4	105	7	66	2	30	0	64	50	2.55	-.68	1.03	5	6	.0	0	11.5	SSW	56	N	1	17	12	2	3.5	90
OREGON																																
Astoria	12	1017.6	1018.8	66	53	59.7	-2.1	73	28	46	10	0	0	54	85	2.24	1.06	1.19	14	1	.0	0	5.1	NW	--	---	--	3	5	23	8.3	--
Burns CO	4140	873.0	1013.8	79	47	62.8	-4.4	95	1	35	16	2	0	36	41	.53	.26	.41	4	3	.0	0	----	---	--	---	--	13	8	10	5.1	--
Eugene	361	1003.7	1017.0	75	50	62.2	-3.8	86	1	44	6+	0	0	52	72	.83	.45	.33	10	0	.0	0	6.1	N	*21	N	10	9	8	14	6.0	--
Meacham	4050	------	------	70	45	57.4	-5.2	89	1	36	25	0	0	--	--	2.40	1.98	1.07	12	9	.3	T	----	---	--	---	--	14	2	15	5.5	--
Medford	1312	968.2	1015.2	82	53	67.2	-3.9	97	1	45	16	5	0	49	57	.40	.21	.29	4	2	.0	0	3.9	NNW	*21	SE	27+	17	5	9	3.9	--
Pendleton	1492	961.4	1014.2	81	54	67.3	-5.4	98	1	45	25	2	0	43	46	.88	.55	.41	9	7	.0	0	8.3	W	--	---	--	15	3	13	4.9	--
Portland	22	1011.2	1017.2	72	55	63.3	-4.0	82	1	48	9	0	0	55	76	1.92	1.31	.66	10	2	.0	0	5.1	NW	22	S	24	2	6	23	8.0	40
Roseburg	505	998.3	1016.9	77	51	64.0	---	87	1+	45	24	0	0	--	--	1.19	.87	.36	8	3	.0	0	5.6	---	18	N	11	11	5	15	5.5	55
Salem	195	1009.8	1017.1	75	51	63.1	-3.9	86	1	43	9	0	0	52	71	.72	.23	.32	9	3	.0	0	5.6	N	--	---	--	7	8	16	6.6	--
Sexton Summit CO	3836	------	------	67	47	56.8	-6.9	82	1	39	24	0	0	--	--	.74	.45	.35	4	0	.0	0	----	---	--	---	--	17	3	11	4.1	--
PENNSYLVANIA																																
Allentown	376	1001.4	1015.2	80	58	69.4	-2.4	90	16	48	18	1	0	60	74	7.01	2.52	3.15	10	5	.0	0	8.2	WSW	--	---	--	4	13	14	6.5	--
Harrisburg	335	1001.7	1015.4	81	62	71.4	-1.6	92	19+	52	18	2	0	59	69	5.79	2.45	1.86	15	7	.0	0	6.2	W	34	NW	16	4	13	14	7.0	58
Philadelphia CO	26	------	------	81	67	74.0	-1.2	91	19	61	22	2	0	--	--	6.03	1.41	2.07	9	3	.0	0	7.3	---	23	W	16	5	13	13	6.3	51
Philadelphia	13	1010.2	1014.6	83	65	73.5	-.5	93	19	57	12	4	0	61	68	4.86	.28	1.41	10	4	.0	0	8.5	WSW	*40	NW	20	7	12	12	6.3	--
Pittsburgh CO	749	------	------	81	63	72.4	-.7	94	24	55	13	3	0	--	--	5.33	2.25	1.35	13	--	.0	0	----	---	--	---	--	--	--	--	---	58
Pittsburgh	1151	985.8	1016.3	79	61	69.9	-.2	93	24	51	31+	1	0	60	74	2.92	-.21	1.00	12	6	.0	0	8.8	WSW	*39	NNW	16	4	16	11	6.5	52
Reading CO	266	1003.1	1014.6	81	63	72.3	-1.1	92	16	54	18	2	0	--	--	7.57	3.69	2.11	13	7	.0	0	8.8	---	51	W	19	5	11	15	6.8	52
Scranton CO	746	985.8	1014.6	78	59	68.4	-1.9	87	16	47	18	0	0	--	--	4.41	.74	1.71	16	5	.0	0	5.7	---	33	SW	19	5	15	11	6.7	53
Williamsport	527	995.9	1015.0	82	58	69.8	-1.1	92	19	46	18	3	0	59	74	3.72	.11	1.40	17	9	.0	0	6.3	W	*45	WSW	19	4	10	17	7.1	--
RHODE ISLAND																																
Block Island	110	1009.5	1013.6	74	61	67.3	-1.7	81	1	54	27	0	0	--	--	9.73	6.27	3.54	13	7	.0	0	----	---	--	---	--	8	11	12	6.2	--
Providence	55	1007.8	1013.6	77	58	67.8	-1.6	87	25+	49	29+	0	0	59	75	8.30	4.67	4.17	11	2	.0	0	10.6	SW	*90	ESE	31	8	10	13	6.3	52
SOUTH CAROLINA																																
Charleston CO	9	------	------	92	77	84.1	3.1	102	5	73	8	20	0	--	--	.18	-6.36	.12	5	12	.0	0	9.8	---	31	N	30	19	7	5	3.7	85
Charleston	41	1014.2	1016.1	94	70	82.3	2.7	102	17	62	8	28	0	71	74	2.41	-4.20	1.30	6	8	.0	0	8.5	SW	--	---	--	10	16	5	4.6	--
Columbia	217	1007.8	1015.9	96	71	83.1	3.1	106	17	64	25	30	0	69	68	5.91	.38	2.91	9	12	.0	0	5.9	SW	--	---	--	13	16	2	3.8	89
Florence	146	1010.5	------	97	70	83.6	4.3	106	17+	63	8	30	0	--	--	1.25	-3.53	.87	6	10	.0	0	----	---	--	---	--	11	19	1	3.8	--
Greenville	1018	979.7	1016.1	93	69	81.0	3.8	100	17	64	17	21	0	64	62	1.49	-3.31	.99	8	10	.0	0	8.0	W	70	SE	17	6	20	5	5.5	72
Spartanburg	801	------	------	93	70	81.6	3.9	101	5	64	13	22	0	--	--	.89	-3.80	.36	8	9	.0	0	----	---	--	---	--	--	--	--	---	--
SOUTH DAKOTA																																
Huron	1282	967.8	1014.1	86	60	72.8	-.1	104	15	49	10	5	0	59	66	1.74	-.24	1.15	5	6	.0	0	10.0	SSE	45	SE	21	9	15	7	5.2	76
Rapid City	3165	901.1	1013.1	87	58	72.5	1.6	103	31	51	23	10	0	53	57	2.11	.55	.96	8	10	T	T	9.8	SSE	42	NE	10	16	8	7	4.4	64
Sioux Falls	1420	964.4	1015.1	82	61	71.5	-.9	95	15	52	12+	2	0	60	72	2.27	-1.01	.94	7	9	.0	0	9.0	SE	*30	NW	15	10	10	11	5.6	--
TENNESSEE																																
Bristol	1519	963.8	------	87	64	75.8	2.2	98	16	54	12	10	0	--	--	.82	-3.07	.26	6	11	.0	0	----	---	--	---	--	4	19	8	5.9	--
Chattanooga	670	989.8	1016.7	93	69	81.0	3.7	101	16+	63	10	25	0	68	73	2.71	-.99	2.22	7	12	.0	0	2.6	SSW	30	SW	2	12	9	10	5.2	68
Knoxville	950	982.4	1017.1	91	69	79.9	2.9	99	16	61	31+	16	0	66	68	.77	-2.66	.30	7	7	.0	0	6.5	WSW	37	SW	2	8	14	9	5.6	49
Memphis CO	271	------	------	94	76	84.9	4.6	100	17+	67	31	27	0	--	--	3.27	.74	1.92	6	--	.0	0	----	---	--	---	--	--	--	--	---	--
Memphis	263	1001.4	1015.6	97	73	85.0	4.7	102	17+	65	10	28	0	69	64	2.66	-.28	1.67	6	5	.0	0	7.5	S	42	S	20	16	12	3	3.4	87

See footnotes at end of table.

CLIMATOLOGICAL DATA

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature										Average dew point	Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below			Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.		⁎		°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
TENNESSEE (Cont.)																																
Nashville	577	977.0	1016.4	94	71	82.3	3.6	104	16	61	31	23	0	68	67	1.61	-1.70	0.74	9	10	0.0	0	4.7	S	42	NW	8	14	10	7	4.7	65
Oak Ridge CO	905	984.4	------	90	67	78.2	1.6	100	16	57	31	19	0	--	--	2.73	-1.33	.92	10	13	.0	0	4.0	---	23	W	2	9	13	9	5.5	--
TEXAS																																
Abilene	1759	953.6	1012.7	98	75	86.5	3.7	103	5+	69	8+	31	0	61	47	.85	-.24	.50	3	2	.0	0	13.6	SSE	51	NW	8	20	9	2	3.1	92
Amarillo	3590	890.3	1012.2	93	67	79.9	3.3	102	5	62	9+	24	0	59	55	2.91	-.08	1.24	8	9	.0	0	12.5	S	34	SE	7	21	4	6	3.6	82
Austin	615	993.6	1015.1	99	75	86.6	2.1	105	31	71	23	31	0	68	61	1.14	-.53	.54	4	5	.0	0	10.2	S	33	SW	30	13	14	4	4.2	83
Brownsville	16	1012.2	1014.5	93	76	84.7	.6	97	31	69	30	28	0	74	75	.60	-1.85	.27	8	4	.0	0	11.6	SE	27	SE	2+	14	13	4	4.1	76
Corpus Christi	40	1014.2	1015.3	95	77	86.0	3.0	102	30	73	30	31	0	75	74	.45	-1.63	.42	2	2	.0	0	12.5	SSE	33	SE	5	13	14	4	4.0	97
Dallas	487	996.6	1015.1	100	77	88.4	2.6	107	30	67	10	31	0	66	52	1.64	-.19	1.10	3	4	T	0	12.0	SSE	53	SE	30	18	11	2	2.0	77
Del Rio	1091	979.7	1013.1	98	75	86.1	1.0	101	8+	70	1	31	0	65	55	.37	-1.07	.42	2	1	.0	0	9.8	---	29	SE	28	12	15	4	4.2	74
El Paso	3920	886.6	1011.9	91	68	79.3	-.5	101	1	61	23+	21	0	58	51	2.37	1.05	1.70	12	13	.0	0	11.6	S	48	NE	1	8	16	7	5.1	78
Fort Worth	544	994.6	1014.7	100	77	88.8	3.4	106	30	68	10	31	0	64	49	.81	-1.07	.50	2	3	.0	0	13.6	S	*31	E	30	20	10	1	2.8	—
Galveston CO	7	------	------	89	80	84.3	.7	97	30	73	24	7	0	--	--	1.28	-2.27	.84	6	--	.0	0	11.2	---	29	NE	29	--	--	--	---	06
Galveston	5	1014.2	1016.3	90	79	84.7	1.0	97	30	74	22+	20	0	77	78	1.77	-1.85	1.14	6	5	.0	0	10.8	SSW	--	---	--	12	16	3	4.1	--
Houston CO	41	1010.8	------	95	77	85.7	1.5	101	30	73	24	28	0	--	--	1.57	-1.52	.69	7	10	.0	0	8.3	---	28	SE	17	11	15	5	4.6	82
Houston	50	1012.9	1015.5	94	75	84.5	1.6	100	30	72	7+	25	0	73	73	3.89	-.23	1.44	8	6	.0	0	9.4	SSE	--	---	--	11	16	4	4.8	--
Laredo	500	998.0	1013.1	100	77	88.3	.5	105	8	71	29	30	0	69	59	.45	-.85	.45	1	2	.0	0	16.0	SE	*40	ESE	29	16	12	3	3.5	--
Lubbock	3243	903.8	1012.5	92	67	79.6	1.2	100	5	64	24	24	0	62	59	2.92	1.13	1.32	8	6	.0	0	10.9	S	*40	NNE	2	16	11	4	4.0	--
Midland	2854	916.0	1012.7	95	70	82.4	1.0	101	7	65	22	30	0	59	51	1.26	-.39	.61	7	8	.0	0	6.4	SSE	*30	NE	30	15	13	3	3.9	--
Port Arthur	16	1014.9	1016.1	93	74	83.5	1.7	99	30	69	11	27	0	75	80	4.58	-.56	1.59	10	14	.0	0	8.8	S	45	NW	10	13	14	4	4.5	76
San Angelo	1903	947.9	1013.4	96	73	84.5	1.3	101	6	68	31	30	0	61	49	.12	-1.47	.12	1	2	.0	0	10.3	S	*34	SE	30	19	12	0	3.3	--
San Antonio	792	986.8	1014.6	98	75	86.7	2.3	103	31	71	29	31	0	67	59	1.05	-.93	.77	4	5	.0	0	9.2	SSE	32	S	19	11	16	4	4.4	83
Victoria	110	1010.5	1015.0	97	76	86.3	1.0	104	31	72	7	30	0	71	66	1.11	-1.52	.54	8	8	.0	0	8.0	---	*34	NW	31	15	14	2	4.1	--
Waco	500	996.3	1014.5	99	76	87.7	2.2	106	30	72	23	31	0	69	57	.17	-1.21	.15	2	4	.0	0	13.0	S	--	---	--	22	7	2	2.9	--
Wichita Falls	1027	977.3	1012.8	100	77	88.6	4.4	105	7+	68	10	31	0	62	46	.04	-2.03	.04	1	2	.0	0	10.1	S	*30	SE	22	25	6	0	2.3	--
UTAH																																
Milford	5028	845.2	1013.3	89	52	70.1	-1.6	98	2	41	18	9	0	--	--	1.04	.23	.58	4	4	.0	0	----	---	--	---	--	22	6	3	2.8	--
Salt Lake City	4222	866.9	1011.3	89	58	73.2	-1.2	102	2	45	18	13	0	44	39	1.77	.80	1.62	2	5	T	0	10.2	SSE	36	S	13	18	10	3	2.8	85
VERMONT																																
Burlington	331	999.0	1013.2	75	55	65.1	-3.0	90	25	41	27	1	0	57	76	3.60	.59	1.62	16	6	.0	0	8.9	S	38	N	31	4	14	13	6.4	64
VIRGINIA																																
Lynchburg	947	983.1	1015.9	85	65	75.2	1.0	97	16	53	12	8	0	--	--	2.00	-2.35	.62	12	7	.0	0	7.3	---	31	NW	16	9	11	11	5.9	65
Norfolk	26	1014.9	1015.9	87	69	77.9	1.5	97	26	61	13	11	0	67	73	7.27	2.19	2.74	15	9	.0	0	8.1	SW	43	NE	30	13	12	6	4.7	59
Richmond	162	1010.2	1015.9	87	66	76.8	.9	101	16	53	12	11	0	65	71	3.95	-1.10	1.69	10	10	.0	0	7.2	WSW	34	SE	19	9	13	9	5.5	60
Roanoke	1174	975.3	1016.7	86	65	75.7	1.4	98	16	53	13	10	0	62	70	3.18	-1.36	1.20	12	11	T	T	7.2	W	--	---	--	4	16	11	6.4	--
WASHINGTON																																
Olympia	190	1009.8	1017.4	71	48	59.5	-3.4	86	1	39	4	0	0	51	77	1.74	1.08	.70	11	0	.0	0	5.6	SW	*21	SW	23	2	8	21	7.9	--
Seattle CO	14	------	------	69	55	62.0	-3.2	78	1	52	1+	0	0	--	--	1.22	.35	.31	11	1	.0	0	6.9	---	26	SW	22	3	6	22	8.1	31
Seattle	14	1016.2	1017.4	--	--	----	---	---	--	--	--	--	--	53	75	----	----	----	--	--	---	--	6.5	SSE	--	---	--	--	--	--	---	--
Seattle-Tacoma	379	1003.4	1017.7	69	53	60.6	-3.0	80	1	45	25	0	0	54	81	1.57	.69	.47	13	2	.0	0	8.9	SW	--	---	--	3	6	22	7.8	--
Spokane	2357	945.8	1014.2	77	52	64.5	-3.4	92	1	44	25	1	0	45	53	1.25	.76	.39	7	7	.0	0	6.9	SW	22	S	13	8	8	15	6.0	64
Stampede Pass CO	3958	880.8	1018.8	57	44	50.4	-6.2	76	1	38	23+	0	0	--	--	3.51	1.43	.97	20	2	.0	0	----	---	--	---	--	4	9	18	7.4	--
Tatoosh CO	101	1014.6	1017.8	59	51	54.8	-.9	67	28	47	1	0	0	53	95	2.95	.94	1.11	16	0	.0	0	9.0	S	40	S	29	0	3	28	9.3	16
Walla Walla CO	949	978.7	1013.9	81	59	70.0	-4.2	99	1	50	25+	3	0	--	--	.96	.62	.36	5	6	.0	0	5.5	---	24	W	30	12	10	9	4.5	74
Walla Walla	1200	------	------	--	--	----	---	---	--	--	--	--	--	48	--	----	----	----	--	--	---	--	8.2	S	--	---	--	--	--	--	---	--
Yakima	1061	975.3	1013.9	81	50	65.4	-4.1	95	1	41	4	1	0	45	51	.20	-.02	.11	4	2	.0	0	9.0	WNW	--	---	--	14	7	10	4.4	--
WEST VIRGINIA																																
Charleston	950	981.7	1016.6	82	64	73.1	-.5	93	16	50	13	3	0	66	81	7.96	3.41	1.64	15	15	.0	0	6.3	S	*27	NNW	16	1	15	15	7.4	--
Elkins	1970	------	------	79	59	68.7	.5	86	25+	46	12+	0	0	--	--	6.41	2.58	1.34	17	13	.0	0	4.0	---	*29	NW	15	1	9	21	7.8	--
Huntington	565	------	------	86	65	75.6	.2	97	16	52	13	7	0	--	--	4.18	.81	1.47	14	--	.0	0	----	---	--	---	--	--	--	--	---	--
Parkersburg	837	------	1016.2	--	--	----	---	---	--	--	--	--	--	64	--	----	----	----	--	--	---	--	5.2	WSW	--	---	--	--	--	--	---	--
WISCONSIN																																
Green Bay	689	993.9	1016.9	77	54	65.4	-2.4	88	23	42	17	0	0	57	76	1.61	-1.42	.55	8	5	.0	0	6.7	SW	34	W	25	6	15	10	6.0	59
La Crosse	652	991.9	1016.2	80	69	70.1	-1.3	90	15	49	11	1	0	60	71	3.56	.27	1.06	11	10	.0	0	5.3	SE	*20	WSW	22	4	13	14	6.7	--
Madison	857	982.7	1016.5	81	57	69.2	-1.5	92	23	45	11	2	0	60	76	2.78	-.11	1.05	9	7	.0	0	7.3	SSE	30	N	2	6	12	13	6.5	67
Milwaukee	675	991.9	1016.8	78	62	69.7	-.2	91	23	52	11+	1	0	61	77	3.86	1.24	.95	9	6	.0	0	8.9	SW	32	SW	25	7	10	14	6.2	74
WYOMING																																
Casper	5322	838.1	1010.7	88	55	71.1	2.2	95	30	43	22	9	0	39	37	.29	-.57	.20	3	9	.0	0	12.0	SW	--	---	--	14	11	6	4.3	--
Cheyenne	6131	814.8	1013.7	82	54	68.2	1.4	93	3	49	8+	3	0	45	50	1.38	-.23	.96	8	8	T	T	10.1	W	37	NW	24	12	15	4	4.7	68
Lander	5563	836.4	1012.7	86	53	69.4	1.0	95	2+	38	22	7	0	36	33	.14	-.46	.08	4	5	.0	0	8.4	---	40	SW	14	15	11	5	4.0	87
Sheridan	3942	883.5	1012.6	87	53	69.6	1.0	103	31	44	18	10	0	--	--	1.05	.23	.66	9	9	T	T	7.2	NNW	49	N	12	13	14	4	4.2	78
PACIFIC AREA																																
Canton Island	9	1010.2	1010.5	89	77	82.9	-1.3	94	6	73	21	8	0	73	75	1.98	-.42	.63	11	0	.0	0	----	---	--	---	--	11	15	5	4.7	--
Hilo	31	1014.6	1015.6	83	70	76.3	.9	85	4+	66	20	0	0	70	84	13.62	1.70	2.68	29	0	.0	0	6.1	W	*20	SE	12	1	9	21	7.9	47
Honolulu	7	1015.9	1016.6	85	74	79.5	.1	88	10	72	10+	0	0	67	69	.19	-.61	.09	5	0	.0	0	13.4	ENE	29	E	19	9	18	4	5.0	76
Koror CO	94	1005.8	1009.6	88	75	81.2	.5	91	31	72	1	7	0	76	84	13.48	-1.37	3.07	22	3	.0	0	----	---	--	---	--	1	9	21	8.2	--
Lihue	115	1011.5	1016.8	84	73	78.7	.6	85	11+	67	30	0	0	70	76	1.04	-1.23	.28	18	1	.0	0	13.3	ENE	24	NE	4+	2	17	12	7.0	44
Ponape CO	112	1004.7	1009.9	87	72	79.6	-.4	90	12+	69	4	3	0	75	86	17.89	2.52	2.97	28	5	.0	0	----	---	--	---	--	0	13	18	7.8	--
Truk (Moen Island)	8	1009.8	1010.4	86	75	80.9	.6	88	1+	73	8+	0	0	76	85	14.07	1.47	3.40	22	0	.0	0	----	---	--	---	--	0	10	21	8.5	--
Wake Island	11	1013.2	1013.5	86	77	81.5	-1.0	88	24+	70	11	0	0	75	81	5.78	-3.12	1.89	20	0	.0	0	14.7	E	--	---	--	5	15	11	6.4	--
Yap CO	53	1007.5	1009.4	89	75	82.1	.5	92	10+	72	14	16	0	76	85	8.81	-7.12	2.53	24	0	.0	0	----	---	--	---	--	1	6	24	8.7	--
WEST INDIES																																
San Juan CO	47	------	------	86	77	81.0	.5	91	20	72	21	2	0	--	--	8.30	2.04	1.93	25	7	.0	0	----	---	--	---	--	--	--	--	---	--
San Juan, P. R.	9	1012.9	1014.9	87	76	81.6	.9	92	20	70	30	1	0	74	79	9.64	2.19	1.81	26	7	.0	0	11.0	ENE	26	E	15	8	13	10	5.5	75
ALASKA																																
Anchorage	92	1011.9	1017.0	64	49	56.1	.5	71	3	37	22+	2	0	48	73	2.13	-.43	1.07	13	0	.0	0	4.6	SSW	*24	S	28	1	10	20	7.7	41
Annette	110	1013.5	1017.7	67	53	59.8	1.8	80	24	48	28	10	0	53	81	.71	-4.55	.32	9	0	.0	0	9.3	NNW	*22	NW	22	5	10	16	7.2	--
Barrow	22	1008.1	1008.8	53	40	46.6	8.2	71	8	34	1+	1	0	43	91	.95	.15	.19	15	0	.0	0	10.8	---	34	W	20	1	2	28	8.8	--
Bethel	21	1010.8	1012.2	58	46	51.8	-.9	69	15	40	3+	0	0	49	90	3.88	-.14	.96	24	0	.0	0	10.8	SSW	*25	SSE	24+	0	1	30	9.7	--
Cordova	40	1015.6	1017.5	61	44	52.9	-.5	72	25	35	17+	2	0	49	85	8.13	-1.59	3.38	13	0	.0	0	4.2	E	*16	E	1	5	3	23	8.3	--
Fairbanks	436	997.3	1014.3	67	46	56.5	.9	81	7	34	22	13	0	48	75	.84	-1.42	.20	12	0	.0	0	4.5	WSW	34	W	19	4	6	21	7.9	--
Juneau	15	1016.6	1017.4	66	46	56.1	1.9	76	9	38	22+	9	0	48	77	1.11	-4.05	.42	12	0	.0	0	4.9	N	15	E	20	3	9	19	7.8	44
Kotzebue	10	1007.5	1008.1	56	47	51.5	.8	71	11	43	1+	1	0	48	88	4.95	3.00	1.48	17	0	.0	0	16.0	ESE	*35	ESE	22	0	3	28	9.2	--
McGrath	334	1001.4	1014.0	61	46	53.7	.2	72	7	35	15	2	0	48	83	3.22	-.41	.70	16	0	.0	0	4.7	S	*18	SSW	23	0	5	26	8.9	--
Nome	13	1007.5	1008.2	52	46	49.0	-.1	63	16	40	13	0	0	47	90	7.78	4.02	1.55	22	0	.0	0	12.8	SSW	36	S	24	0	1	30	9.6	14
Northway	1713	953.3	1016.2	66	40	53.0	-.7	83	7	27	27	14	8	44	74	.60	-1.21	.27	8	2	.0	0	6.4	NW	*25	NW	25	4	9	18	7.0	--
St. Paul Island	22	1008.5	1009.6	50	44	46.9	-1.1	53	3	42	1	0	0	45	95	3.36	.37	.78	20	0	.0	0	----	---	--	---	--	1	0	30	9.5	--
Yakutat	28	1017.3	1018.5	61	45	52.7	-.1	68	27	34	22	0	0	50	89	2.85	-7.69	.70	13	0	.0	0	6.2	ESE	*20	S	14	4	3	24	8.2	--

Data from airport unless otherwise specified. CO indicates data from city office.
* Data entered in column "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.
+ And also on a later date or dates.
% Peak gust.
⁎ Max. 70°F. or above for Alaskan Stations.
a Maximum hourly average.

Table 3

HEATING DEGREE DAYS

(Base 65°F.)

AUGUST 1954

State and station	Current season		Normals July through this month
	This month	Period July through this month	
ALABAMA			
Birmingham	0	0	0
Mobile	0	0	0
Montgomery (CO)	0	0	0
Montgomery	0	0	0
ARIZONA			
Flagstaff	112	123	127
Phoenix (CO)	0	0	0
Phoenix	0	0	0
Prescott	0	0	0
Tucson	0	0	0
Yuma	0	0	0
ARKANSAS			
Ft. Smith	0	0	0
Little Rock	0	0	0
Texarkana	0	0	0
CALIFORNIA			
Bakersfield	0	0	0
Bishop	4	4	0
Blue Canyon	129	138	77
Burbank	0	0	0
Eureka (CO)	249	533	515
Fresno	0	0	0
Los Angeles (CO)	0	0	0
Los Angeles	0	0	53
Mt. Shasta (CO)	132	159	83
Oakland	101	166	161
Red Bluff	5	5	0
Sacramento (CO)	0	0	0
Sacramento	0	0	0
Sandberg (CO)	40	40	0
San Diego	0	0	18
San Francisco (CO)	222	407	366
San Francisco	120	230	280
San Jose	22	26	18
Santa Maria	94	157	192
COLORADO			
Alamosa	114	137	185
Colorado Springs	7	8	29
Denver	4	4	16
Grand Junction	0	0	0
Pueblo	0	0	0
CONNECTICUT			
Bridgeport	1	1	0
Hartford	16	17	14
New Haven	4	10	18
DELAWARE			
Wilmington	0	0	0
DIST. OF COLUMBIA			
Washington (CO)	0	0	0
Washington	0	0	0
FLORIDA			
Apalachicola (CO)	0	0	0
Daytona Beach	0	0	0
Fort Myers	0	0	0
Jacksonville (CO)	0	0	0
Jacksonville	0	0	0
Key West (CO)	0	0	0
Miami (CO)	0	0	0
Int. Airport, Hialeah	0	0	0
Miami Beach	0	0	0
Orlando	0	0	0
Pensacola (CO)	0	0	0
Tallahassee	0	0	0
Tampa	0	0	0
West Palm Beach	0	0	0
GEORGIA			
Athens	0	0	0
Atlanta	0	0	0
Augusta	0	0	0
Columbus	0	0	0
Macon	0	0	0
Rome	0	0	0
Savannah	0	0	0
IDAHO			
Boise	39	52	0
Lewiston	38	45	0
Pocatello	45	53	0
ILLINOIS			
Cairo (CO)	0	0	0
Chicago (CO)	0	0	
Chicago	0	0	0
Chicago University	2	2	
Moline	2	2	8
Peoria	0	0	11
Springfield	3	3	6
INDIANA			
Evansville	2	2	0
Ft. Wayne	8	8	17
Indianapolis (CO)	0	0	0
Indianapolis	0	0	0
South Bend	15	17	18
IOWA			
Burlington	0	0	0
Des Moines	3	3	17
Dubuque	10	10	36
IOWA (Cont'd.)			
Sioux City	1	1	25
KANSAS			
Concordia (CO)	0	0	0
Dodge City	0	0	0
Goodland	0	1	0
Topeka (CO)	0	0	0
Topeka	0	0	8
Wichita	0	0	0
KENTUCKY			
Lexington	0	0	0
Louisville (CO)	0	0	0
Louisville	0	0	0
Pikeville (CO)	0	0	
LOUISIANA			
Baton Rouge	0	0	0
Lake Charles	0	0	0
New Orleans (CO)	0	0	0
Int.Airport,Moisant	0	0	0
Shreveport	0	0	0
MAINE			
Caribou	174	295	218
Greenville (CO)	135	222	
Portland	72	106	71
MARYLAND			
Baltimore (CO)	0	0	0
Baltimore	0	0	0
Frederick	0	0	0
MASSACHUSETTS			
Blue Bill Obs.	30	37	
Boston	11	11	7
Nantucket	9	21	56
Pittsfield	97	138	88
MICHIGAN			
Alpena (CO)	71	118	135
Detroit	5	15	8
Detroit (Willow Run)	7	18	10
East Lansing (CO)	15	15	
Escanaba (CO)	69	108	157
Grand Rapids (CO)	13	20	20
Grand Rapids	24	37	43
Marquette (CO)	72	148	156
Muskegon	27	45	74
S. Ste. Marie	110	230	235
MINNESOTA			
Duluth (CO)	86	169	157
Duluth	88	144	147
Internat. Falls	130	182	188
Minneapolis	0	1	25
Rochester	20	20	62
St. Cloud	31	51	85
MISSISSIPPI			
Jackson	0	0	0
Meridian	0	0	0
Vicksburg (CO)	0	0	0
MISSOURI			
Columbia	0	0	6
Kansas City	0	0	0
St. Joseph	0	0	5
St. Louis (CO)	2	2	0
St. Louis	2	2	0
Springfield	0	0	8
MONTANA			
Billings	11	14	28
Glasgow (CO)	19	39	44
Great Falls	59	77	74
Havre (CO)	28	48	58
Helena	82	96	102
Kalispell	140	233	130
Miles City	4	9	17
Missoula	122	159	79
NEBRASKA			
Grand Island	3	3	6
Lincoln (CO)	0	0	7
Norfolk	3	3	17
North Platte	2	2	18
Omaha	0	0	5
Scottsbluff	0	3	0
Valentine (CO)	3	4	21
NEVADA			
Elko	88	98	34
Ely	82	90	66
Las Vegas	0	0	0
Reno	83	92	88
Tonopah	17	17	5
Winnemucca	79	85	17
NEW HAMPSHIRE			
Concord	68	87	68
Mt. Washington	663	1274	
NEW JERSEY			
Atlantic City (CO)	0	0	0
Newark	0	0	0
Trenton (CO)	0	0	0
NEW MEXICO			
Albuquerque	0	0	0
Clayton	0	0	0
Roswell	0	0	0
NEW YORK			
Albany	26	40	24
Binghamton	48	80	79
Buffalo	30	37	46
New York (CO)	0	0	0
La Guardia Field	0	0	0
Rochester	37	46	43
Schenectady	22	24	
Syracuse	34	38	29
NORTH CAROLINA			
Asheville (CO)	0	0	0
Asheville	0	0	
Charlotte	0	0	0
Greensboro	0	0	0
Hatteras (CO)	0	0	0
Raleigh	0	0	0
Wilmington	0	0	0
Winston-Salem	0	0	0
NORTH DAKOTA			
Bismarck	17	40	66
Devils Lake (CO)	58	186	108
Fargo	21	37	66
Grand Forks	38	59	
Pembina	8	30	
Williston (CO)	20	56	71
OHIO			
Akron	11	22	17
Cincinnati (CO)	0	0	0
Cincinnati	2	2	6
Cleveland (CO)	0	2	9
Cleveland	2	5	10
Columbus	4	4	8
Dayton	7	7	5
Sandusky (CO)	0	0	0
Toledo	6	13	12
Youngstown	22	37	19
OKLAHOMA			
Oklahoma City	0	0	0
Tulsa	0	0	0
OREGON			
Astoria	158	377	249
Burns (CO)	118	151	47
Eugene	87	161	67
Meacham	240	368	190
Medford	24	26	0
Pendleton	24	35	0
Portland (CO)	41	85	27
Portland	57	120	47
Roseburg	46	86	
Salem	65	139	44
Sexton Summit (CO)	250	369	157
PENNSYLVANIA			
Allentown	5	5	9
Harrisburg	0	0	0
Philadelphia (CO)	0	0	0
Philadelphia	0	0	0
Pittsburgh (CO)	1	1	0
Pittsburgh	9	17	20
Reading (CO)	0	0	5
Scranton (CO)	11	14	18
Williamsport	8	9	16
RHODE ISLAND			
Block Island	4	9	27
Providence	13	19	26
SOUTH CAROLINA			
Charleston (CO)	0	0	0
Charleston	0	0	0
Columbia	0	0	0
Florence	0	0	0
Greenville	0	0	0
Spartanburg	0	0	0
SOUTH DAKOTA			
Huron	0	1	26
Pierre	0	0	
Rapid City	0	1	56
Sioux Falls	1	1	37
TENNESSEE			
Bristol	0	0	0
Chattanooga	0	0	0
Knoxville	0	0	0
Memphis	0	0	0
Nashville	0	0	0
TEXAS			
Abilene	0	0	0
Amarillo	0	0	0
Austin	0	0	0
Brownsville	0	0	0
Corpus Christi	0	0	0
Dallas	0	0	0
Del Rio	0	0	0
El Paso	0	0	0
Ft. Worth	0	0	0
Galveston (CO)	0	0	0
Galveston	0	0	0
TEXAS (Cont'd.)			
Houston (CO)	0	0	0
Houston	0	0	0
Laredo	0	0	0
Lubbock	0	0	0
Midland	0	0	
Port Arthur	0	0	0
San Angelo	0	0	0
San Antonio	0	0	0
Victoria	0	0	0
Waco	0	0	0
Wichita Falls	0	0	0
UTAH			
Milford	2	2	0
Salt Lake City	5	7	0
VERMONT			
Burlington	57	184	66
VIRGINIA			
Lynchburg	0	0	0
Norfolk	0	0	0
Richmond	0	0	0
Roanoke	0	0	0
WASHINGTON			
Olympia	166	331	174
Seattle (CO)	92	179	94
Seattle	130	277	145
Spokane	72	118	45
Stampede Pass (CO)	447	840	511
Tatoosh Island (CO)	310	634	583
Walla Walla (CO)	7	12	0
Yakima	51	94	7
WEST VIRGINIA			
Charleston	5	5	0
Elkins	22	34	40
Huntington (CO)	0	0	0
Parkersburg (CO)	1	1	0
WISCONSIN			
Green Bay	55	76	90
La Crosse	9	9	31
Madison (CO)	10	11	40
Madison	14	14	44
Milwaukee	12	21	52
WYOMING			
Casper	4	4	37
Cheyenne	14	25	72
Lander	19	23	30
Sheridan	12	12	68
ALASKA			
Anchorage	269	484	530
Annette	159	504	479
Barrow	566	1357	1609
Bethel	407	738	707
Cordova	368	737	723
Fairbanks	263	471	445
Juneau	273	599	654
Kotzebue	412	884	827
McGrath	341	592	563
Nome	489	1010	970
Northway	367	629	536
St. Paul	556	1189	1119
Yakutat	373	776	759

Data from airport unless otherwise specified.
CO indicates data from city office.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4

AUGUST 1954

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Yuma area, Ariz.	1	12:15 a.m.	100	*30			°$25,000		Wind	Wind damage to trees, signs, roofs, and grain elevator. Some damage to alfalfa seed crops. Moved northwestward.
Beatrice (4 miles north of), Nebr.	1	2:30 a.m.						$10,000	Hail	
Claremont, Va.	1				1				Wind	Drowning from overturned sailboat.
Paoli, Orange County, Ind.	1				0	0	1,500	0	Tornado	Brooder house carried across barn lot; wreckage strewn several hundred feet; trees and electrical poles in path of brooder house clipped off. Parts of roofs of several other farm buildings stripped off and window frames torn out.
Rush City and vicinity, Chisago County, Minn.	1	12:40 p.m.	12	*1			3,200	15,000	Hail	Moderate to heavy hail accompanied severe thunderstorms. Some hailstones 1½ inches in diameter. Hailstones numerous and covered ground entirely in places to depth of 1 to 2 inches. Storm moved southeastward.
Adams County, N. Dak.	1	Afternoon	20				Small	Considerable	Hail, wind, and rain	A sudden storm of wind, rain, and hail swept southeastward across Valley City-Cuba area causing heavy damage to corn and other crops. Visibility reported as zero haulted traffic.
Polk County (northern portion), Wis.	1	2 p.m.	8	1800					Hail	Townships of West Salem, Luck, and Milltown hit by hail. Total of 18 farmsteads reported hail damage. Heaviest damage reported at 1 farm was 34 acres of oats practically threshed while standing and 20 acres of corn stripped of its leaves. Hailstones reported as large as golf balls; ground completely covered. Storm moved southeastward; duration approximately 1 hour.
Mobridge, Walworth County, S. Dak.	1	2 p.m.							Tornado	Tornado sighted east-southeast of Mobridge; did not reach ground.
Southwestern Washington, southeastern Republic, and Clay Counties, Kans.	1	3:30-5 p.m.	40	*5	0	0	532,000	1,608,000	Hail, wind, tornado, and rain	Severe hail accompanied by winds estimated up to 75 m.p.h. and torrential rain amounting locally to 3 to 5 inches. Hailstones size of golf balls fell in Clay Center for 30 minutes. Storm apparently progressed from north to south with 2 to 3 mile wide strip of 75 to 100 percent crop damage. Hail drifts more than 3 feet high reported. 1 drift in cornfield near Brantford investigated at 9 a.m. the following day was then 200 feet long, 70 feet wide, and up to 3 feet deep. Funnel observed high aloft west of Clifton at 4:15 p.m., moving northeastward.
Fillmore and northern Thayer Counties, Nebr.	1	4-4:20 p.m.	15	*5			51,000	567,000	Hail	Stones size golf to baseballs; ground covered.
Forsyth, Granville, Surry, Vance, Yadkin, Halifax, and Henderson Counties, N. C.	1	4-5 p.m.					8,000	317,200	Hail and electrical	Most damage to tobacco in fields. Property damage partly due to lightning.
Gregory County, S. Dak.	1	5:30 p.m.	25			2	85,000		Tornado	Buildings on 12 farms, filling station, and structures on ball field at Burke damaged hy tornado which formed 9 miles northwest of Gregory and followed southeastward path to south edge of Burke.
Ellis, Rush, and Pawnee Counties, Kans.	1	5:30-7 p.m.	50	*5-10		1	1,130,000	820,000	Hail and wind	Severe property and crop damage from wind-driven hail in north-south strip from Yocemento southward to Larned and also heavy hail damage in Burdette area of western Pawnee County. In more severe damage areas hailstones size of golf balls fell for 20 minutes. Storm apparently progressed from north to south. Property damage by hail $930,000, by wind $200,000. Crop damage by hail $820,000.
Dickinson County, Kans.	1	6:20 p.m.			0	0	20,000		Wind and tornado (possible)	Isolated wind damage. Possible tornado reported near Enterprise. Tornado moved southeastward.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Morris County, Kans.	1	7 p.m.	25	*15			$40,000	$10,000	Wind	Scattered wind damage over area from Wilsey to Dunlap and 7 to 10 miles either side.
Pratt County, Kans.	1	8 p.m.					50,000		do	Winds estimated to 80 m.p.h. caused extensive damage to buildings, trees, and power lines over area within 10 to 15 miles of Pratt. About 30 large tanks at Pratt airport damaged. Moved southwestward.
Harper County, Kans.	1	Evening					10,000		do	Isolated wind damage. Walls of new highway building at Anthony blown down.
Coffey, Anderson, Miami, Linn, and Bourbon Counties, Kans.	1	Evening					50,000		Wind and electrical	Much minor and some major wind damage throughout area. At least 2 barns and contents burned after lightning strikes. Damage by wind $45,000, by lightning $5,000.
Augusta (east of), Butler County, Kans.	1	Evening					30,000		Electrical	Damage to motel.
Woodward, Okla.	1	Night					10,000		Wind	Creamery unroofed. Minor damage to several homes and business places.
	1									Minor storms also reported in vicinities of Pawnee City and Overton, Nebr.; at Bowling Green and in Southampton County, Va., and in Middlebourne, W. Va.; in Ashurst area, Ariz.; at Nashville, Tenn.; at Summerfield, Fairview, and McCune, Kans.; in vicinities of Brainerd and Pokegama Falls, Minn.; and at Lordsburg, N. Mex.
Diller-Ellis areas, Nebr.	2	4-5 a.m.	7	*4			3,000	69,000	Hail	Stones 1 to 3 inches in diameter; ground covered 3 to 6 inches deep.
Northport, Mich.	2	Noon			0	0	0	0	Waterspouts	2 waterspouts, 8 minutes apart, developed off Northport Point and moved slowly southeastward across Grand Traverse Bay. They disappeared before reaching land.
Trim's Camp (Mile 221), Alaska	2, 19, 20								Rain	On 2d, heavy rains in Isabella Pass area, 83 miles north of Gulkana, washed out several temporary highway bridges between Trim's Camp (Mile 221) Richardson Highway and Black Rapids. Creeks in Trim's Camp and Black Rapids area again swelled with heavy rains, beginning 19th and continuing through morning of 20th, washing out a number of temporary bridges which had been repaired after rainstorm of 2nd.
Caswell, Hoke, and Rockingham Counties, N. C.	2	Afternoon						24,000	Hail	Largely to tobacco.
Rose Hill, Va.	2	2-2:20 p.m.	3½	*1				100,000	do	Damage to tobacco and corn.
Greenville, Clarendon, Charleston, Richland, Lexington, Greenwood, and Marion Counties, S. C.	2	2-7 p.m.					12,000	14,000	Wind, hail, and rain	Gusts to 70 m.p.h. reported at Columbia Airport tower. Slight damage to aircraft. Widespread wind damage in at least 4 areas of State to homes and other buildings and power lines. Crops hit by hail, wind, and rain.
Taylor and Washington Counties, Ky.	2	3-3:30 p.m.	1½	100	0	0	10,000	3,000	Tornado	Tornado first appeared near Finley in Taylor County. After leaving Finley section, tornado completely missed Marion County and came to earth again in Washington County, a short distance south of Springfield. Funnel cloud dissipated in Washington County. 3 barns, small school house, and garage destroyed, and store building damaged in Taylor County. In Washington County, tornado ripped roof from 2 sheds, twisted and shattered a number of trees, damaged some tobacco, and leveled swath through corn field. Storm moved northeastward.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Chatham, Va.	2	4-4:10 p.m.	1	440-880				$11,000	Wind and hail	Moved southeastward.
Independence, Va.	2	P.m.							Electrical	Barn burned and cows killed by lightning.
Chowan, Northampton, Alamance, Orange, and Wake Counties, N. C.	2	5-8 p.m.					$20,000	5,000	Electrical and wind	Several farm buildings burned when struck by lightning, also 1 lumber warehouse. Crop damage mostly due to wind.
Berrien County, Mich.	2	Evening					30,700		Electrical	Lightning struck barn in Bertrand Township and resulting fire consumed barn with loss of $14,000. In like manner, barn north of Dayton burned with loss of $15,000. Fire from lightning wrecked interior of house in New Buffalo with loss estimated at $1,500 and caused $200 damage to garage in Buckanan.
Daviess County, Ky.	2	9:30-10 p.m.						300,000	Hail	Storm destroyed many crops with greatest damage to corn and tobacco. Stones ranged in size from 1/4 to 1/2 inch, with about 80 percent of ground covered.
	2									Minor storms also reported at Chase City and vicinity, Va.; in Scott County, Iowa; at Crossville and Memphis, Tenn.; and in Elfrida-McNeal areas, Ariz.
Big Rapids (2 miles east of), Mich.	3	1:30 a.m.							Electrical	Lightning struck barn; ensuing fire destroyed structure and all its contents.
Pigeon (5 miles northwest of), Mich.	3	1:30 a.m.							do	Barn burned to ground as result of lightning.
Connecticut, Rhode Island, and eastern Massachusetts	3	All day				5	5,000		Rain	Heaviest rain concentrated in Hartford, Conn., area. Many streets and cellars flooded, many minor traffic accidents; several fires caused by short-circuited electrical systems. 2500 phones out of order in Hartford area.
Iowa, eastern portion	3-4					1	52,450	2,500	Electrical and wind	Burned houses and other buildings; damaged electrical equipment; killed livestock.
Roberts, Carbon County, Montana	3		18	*1½				25,000	Hail	Damage mostly to wheat; hailstones size of peas.
Yellowstone County (southern portion), Mont.	3-4							120,000	do	
Columbus (south of), Mont.	3	3-4 p.m.	15	*2			Some	70,000	do	Hailstones size marbles and walnuts.
Safford area, Ariz.	3	3:30 p.m.					30,000	10,000	Winds and rain	High winds from southeast with heavy thunderstorms south side of valley causing flash flooding in evening. Wind damage to roofs, utilities, TV antennas, etc., estimated $30,000; flood damage to cotton $10,000. Moved northwestward.
Illinois, central and southwestern portions	3	3:45-10:30 p.m.							Hail and wind	Scattered hailstorms from Mercer County southeastward to northern Macon County. Hailstones 7 inches in circumference. Severe crop damage between Maroa and Forsyth in Macon County. Most severe hailstorms between 3:45 and 4:15 p.m. over Plum Creek south of Marissa. Crops ruined over an area of 12 square miles; 3 planes damaged; 137 windows broken in 1 greenhouse; 4 baby pigs, poultry and rabbits killed by hailstones which reported size of goose eggs with a few size of baseballs. Hail accumulated to a depth of 4 inches in some places. Buildings unroofed by strong winds. Cattle in fields injured by hailstones.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Boyle County, Ky.	3	P.m.						$20,000	Hail	Storm was "spotted" in that it hit farms in certain areas, yet missed adjoining farms. Tobacco most severely affected crop, with corn probably next.
Township of Perinton, N. Y.	3	Late p.m.					$10,000		Electrical	Barn and contents burned by lightning strike.
Phillips County (northern portion), Mont.	3	Evening					Some	25,000	Hail	
Baylor, Valley County, Mont.	3	9:45 p.m.	10	*7				30,000	do	A number of farms sustained total losses of grain.
	3									Minor storms also reported in Boone County, Iowa; near Sunbury, Pa.; in Washington County, Ky.; in vicinity of Elgin, Minn.; north of Carroll, Nebr.; and at Murfreesboro, Tenn.
Cumberland, Marion County, Ind.	4	Early a.m.					10,000		Electrical	Barn and contents destroyed by lightning.
Jefferson County, Ky.	4	A.m.			2				do	2 girls burned to death, when lightning set fire to their home.
West Palm Beach (9 miles west of), Fla.	4				1	1			do	Lightning struck 2 men on piece of farm machinery.
Continental-Sahuarita area, Ariz.	4-5						50,000	50,000	Rain	Heavy thundershowers in mountains draining into Santa Cruz River south of Tucson resulted in flash flooding that flooded crops in lowlands (mainly cotton), damaged railroad right-of-way, highways, bridges, irrigation canals, and power and communication poles and lines. Rain damage $100,000.
Socorro, N. Mex.	4						55,000		do	Property damage due to flash floods.
Windham-Moccasin-Benchland-Ross Fork, Judith Basin and Fergus Counties, Mont.	4	2:30-3 p.m.	15-20	*2-3				500,000	Hail	Hailstones 1/4 to 1/2 inch in diameter.
Pendroy, Teton County, Mont.	4	5 p.m.	12	*1				40,000	do	Damage mostly to wheat. Hailstones up to 1 inch in diameter.
Utah, north-central portion	4	P.m.					10,000		Thunderstorm	Damage mostly in Davis and Utah Counties. Blocked highways resulted in several accidents estimated at $2,700 total damage; small bridges washed out; a few basements flooded; some property damage by high winds. Flash flood at Hurricane, Utah, not included in damage. Storm reported by newspapers as twister in Provo, but damage, mostly by wind to trees, did not indicate tornado; no funnel observed.
Rutland and vicinity, Rutland County, Vt.	4	Evening				3	1,000	20,000	Electrical and hail	Series of sharp thunderstorms. Very heavy hail in Mendon area just to northeast of Rutland did heavy damage to apple orchards and vegetable gardens. 3 persons suffered minor injuries from effects of lightning.
Ohio, West-central and east-central portions	4-5	Late evening and early morning				Few	°75,000		Electrical, wind, rain, and hail	Scattered electrical storms with hail (size of baseballs), flash rains, severe wind, and violent lightning caused undeterminable property and crop damage. Hardest hit were Mercer, Auglaize, Shelby, Clark, Licking and Guernsey Counties. Numerous fires destroyed several barns and a few homes. Hail damage high.
	4									Minor storm also reported west of Jordan, Mont.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Conrad, Mont.	5	1 a.m.	2	*1				$5,000	Hail	Damage to wheat and barley. Hailstones up to 1-1/4 inches in diameter.
Muncie, Delaware County, Ind.	5	1:20 a.m.					$20,300		Wind and electrical	Trees and wires down. Lightning set fire to small garage. 6 autos damaged by falling tree limbs. Damage $300 by lightning, balance by wind.
Kokomo, Howard County, Ind.	5						100,000	5,000	Wind	Many trees and wires down. Buildings damaged. TV antennas bent and broken. Many automobiles damaged by falling trees.
Chino Valley (10 to 15 miles north-northwest of), Ariz.	5	11:48 a.m.	½	440	0	0			Tornado and hail	Funnel cloud observed by W.B.A.S. observer at Prescott. Funnel observed for period of about 10 minutes. It appeared to extend from cloud to ground and then disappear into cloud. Funnel moved northeastward. Hailstones maximum size ½ inch in diameter.
Cassia, Power, Caribou, and Bonneville Counties, Idaho	5	Afternoon						46,000	Hail	Principal damage to grain. $42,000 damage reported near Soda Springs, Caribou County, and about $4,000 in Rockland Valley, Power County. No estimates of damage from other counties. Maximum size of hailstones 3/4 inch in diameter.
Kansas, south-central counties	5	4-6 p.m.			0	0	155,000	0	Wind, electrical, and tornado	Much scattered wind damage and many lightning fires from Ellsworth, Barton, and Kiowa eastward to Marion, Sedgewick, and Harper Counties. Several extensive grass fires set by lightning. Most severe damage at Peabody, and narrow path of damage from Peabody 17 miles northeastward indicative of tornado. Suspected spot tornadoes also near Hutchinson at 5:15 p.m., Greensburg and Chase late afternoon. Partial damage estimates by wind and tornadoes $129,000, by lightning $26,000.
Eastern El Paso and western Elbert Counties, Colo.	5	P.m.	35	*15			1,400,000	10,000	Rain, hail, and electrical	Damage mostly to roads, bridges, and property adjoining streams. Some hail losses to crops. Traffic interrupted. Motorists marooned and some losses from lightning to livestock.
St. Marys (3 miles northeast of), Pottawatomie County, Kans.	5	5:30 p.m.							Wind	Buildings on 3 farmsteads extensively damaged.
Northampton, Hampshire County, Mass.	5	Early evening					2,500	10,000	Electrical, wind, hail, and rain	Brief but vicious storm. Trees felled; local floods; tobacco crop damaged severely by hail. 1 home badly damaged by large tree snapped by wind.
Durham County, N. C.	5	6 p.m.					2,000	8,000	Hail and wind	Tobacco destroyed in fields; some outbuildings unroofed by wind.
Homewood, Franklin County, Kans.	5	6:30 p.m.	2	200	0	0	8,000	1,000	Tornado	1 farmstead completely demolished and considerable damage at another. Moved northeastward.
Olivet, Osage County, Kans.	5	Evening							Electrical	Dairy barn and contents burned.
Norfolk and vicinity, Va.	5	7 p.m.	6	*1	0	0		0	Wind, rain, and tornado	Extensive wind and water damage. Funnel cloud observed aloft, but not at ground. Moved eastward.
Westfield, Chautauqua County, N. Y.	5	8 p.m.							Wind and hail	Thunderstorm with winds attaining 70 m.p.h. speeds and hailstones averaging 3/4 inch in diameter seriously damaged grapes and tomatoes. Some windows broken and utility services interrupted because of broken lines.
Ottawa, Franklin County, Kans.	5	8:11 p.m.	1	300	0	2	15,000	0	Tornado	Path through residential area and into business district. Tree damage indicated tornadic winds aloft. Cement block walls of large automobile shed collapsed outward, permitting roof to fall on cars and occupants. Moved northeastward.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
	5									Minor storms also report at Radford, Va., Bayard, W. Va., and Shelbyville, Del.; at Frankfort, Lafayette, Leisure, and Wabash, Ind.; at Alta, Wyo.; and at Lebanon, Tenn.
Madison (near), Greenwood County, Kans.	6	1 a.m.							Electrical	A 2,000 barrel and two 1,000 barrel oil storage tanks burned after lightning strike.
Butler, Ga.	6	Late afternoon			1				Electrical and wind	Death due to lightning. Heavy damage to roofs, TV antennas, wire lines, and trees by wind.
Athens, W. Va.	6				1				Electrical	Girl killed by lightning.
Bakerville-Lowell area, Ariz.	6	3:30 p.m.	2	*1			$2,000		Hail and rain	Hail damage to buildings, automobiles, and equipment. Maximum size of hailstones 1½ inches in diameter.
Sedalia (10 miles north of), Colo.	6	P.m.					16,500		Rain	Damaged roads, highways, and bridges; eroded pastures and crop land; and delayed traffic.
Medora vicinity, Billings County, N. Dak.	6	8 p.m.			0	0			Tornado	DC-4 pilot reported tornado. No confirming ground reports received.
Adams, Jefferson County, N. Y.	6	Night					10,000		Electrical	13-room farm house fired and burned by lightning.
	6									Minor storm also reported at Pueblo, Colo., and at Oskaloosa, Hope, and near Independence, Kans.
Tallahassee, Fla.	7	1:45 p.m.			0	0	800	$0	Tornado (possible)	1 store window broken and several store awnings, mostly in the same block, ripped and battered.
Palmer Lake (10 miles east of), Colo.	7	2-4 p.m.					24,000	Light	Rain	Losses mostly to roads, bridges, and approaches. Some hay and pasture lands adjoining streams suffered damage from erosion and sand disposition.
Deadman Hill (near) Colo.	7	P.m.	2	*½	0	0			Tornado and hail	Storm in isolated forested area; damage to standing timber. Hail accumulated to depth of 6 inches.
Grady, Canadian, Oklahoma, Kingfisher, and Garfield Counties, Okla.	7	5-8 p.m.					60,000		Wind and electrical	Widespread wind damage estimated at $3,000 in Grady County, $10,000 in Canadian County, $42,000 in Oklahoma County, and $5,000 in Garfield County.
Creek, Tulsa, Rogers, and Craig Counties, Okla.	7-8	5 p.m.-2 a.m.				1	115,000		do	In Creek County damage estimated at $10,000 by lightning striking several buildings. In Tulsa County wind damage $50,000 and electrical losses $50,000; winds 50 m.p.h. In Craig and Rogers Counties widespread minor wind damage; losses $5,000. 1 man injured by piece of flying tin from roof of hay shed.
Altamont vicinity, Labette County, Kans.	7	5:30 p.m.	3	400	0	0	20,000	2,000	Wind, hail, and tornado	Suspected tornado damaged several farmsteads northeast of Altamont, and considerable other wind damage in Labette County. Crop damage by hail $1,000, by wind $1,000. Maximum size of hailstones 1 inch in diameter.
Memphis, Shelby County, Tenn.	7	7:41 p.m.			1		Slight	Slight	Thunderstorm	Streets flooded. Utilities disrupted. Automotive equipment damaged by falling trees.
Yucca (12 miles south of), Ariz.	8	4 p.m.	4	250			1,500		Hail	Hail damage to buildings, automobiles, equipment, and other property. Hailstones maximum size 1 inch in diameter.
Fayette County, Ky.	8	4:50-6 p.m.					28,000	5,000	Wind	Winds ranged up to 70 m.p.h. Gusts flattened revival tent and damaged it beyond repair. Tobacco flattened and bruised. Trees and limbs blown over, causing damage to power lines. 3 cars damaged by falling trees.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Warren County, N. C.	8	5 p.m.						$50,000	Hail	Tobacco destroyed over 10 square miles.
Dunlap, Sequatchie County, Tenn.	8	6 p.m.-midnight	3	*12			$8,550	16,550	Hail and rain	Thunderstorm with intense hail.
Cleveland, Bradley County, Tenn.	8	During night			1		32,000	7,000	Rain	Thunderstorm with heavy rains caused flash flood which flooded streets and homes.
	8									Minor storms also reported at Lafayette and Brotherton, Tenn.; near Apple River, Wis.; at Augusta, Ky.; in vicinity of Baudette, Minn.; in Dawson County and near Ogallala, Nebr.; and at Billings, Mont.
Bristol County, Mass., New London and Middlesex Counties, Conn., and Rhode Island	9, 10	A.m. of 9th-a.m. of 10th				Several			Rain and wind	Record 24-hour rainfall in parts of Rhode Island and Bristol County, Mass. Heaviest fall concentrated in Fall River, Mass., area where 6.88 inches recorded. Very heavy damage due to washouts, floods, etc. 7 freight cars derailed and toppled 20 feet in Fall River when rain-weakened earth beneath track gave way. Wind and rain damage mostly over eastern part of Connecticut coast.
Clark, Taylor, and Marathon Counties, Wis.	9						35,000		Hail, wind, and electrical	Series of severe thunderstorms did considerable damage to standing grain, grain in shocks, and to corn. Estimate of damage not available. City of Wausau hit hard by storm near 3:30 p.m., as lightning and hail disrupted electrical power and cut off telephones--500 out of order. Trees uprooted and fell into buildings and on automobiles. Wind observed at 50 m.p.h. with gusts to 60 to 65 at Wausau CAA station. Total estimated damage in Wausau $25,000. Dorchester and Neillsville reported $5,000 damage each. Hail generally 1/4 to 1/2 inch in diameter, with some 3/4 inch. In many areas ground completely covered. At Neillsville County Fair was in progress and many tents blown down. Storm centered in southern half of city. Moved southeastward.
Scott and Jackson Counties, Iowa	9	3 p.m.		*1			5,000	70,000	Hail	Destroyed corn and damaged trees, buildings and autos.
Moore, Cleveland and Forsyth Counties, N.C.	9	3-4 p.m.				1	250,000		Electrical and wind	Lightning fire destroyed large millwork plant and injured 1 child at Shelby. Wind damaged 1 airplane and a number of autos.
Greenbush, Alcona County, Mich.	9	3:45-3:46 p.m.	2	500	0	0	10,000	0	Tornado	Tornado struck northeast end of Cedar Lake and along U.S. Highway 23 for about 2 blocks in Section 24 of Greenbush Township of Alcona County, damaging several cottages. Path of tornado arc shaped; came from Lake Huron, moved north to northeast, and returned to Lake Huron.
Gold Stone (east of), Hill County, Mont.	9	4 p.m.	20	*2			Slight	300,000	Hail	Hailstones up to the size of marbles.
Illinois, northern portion	9	4-11 p.m.							do	Local storms over scattered localities. Most severe hailstorms in strip about 20 miles wide from Whiteside County southeastward into northern Champaign County. In this strip severe hail reported from: Garden Plain and Cottonwood sections of Whiteside County; LaMoille section of Bureau County; Grand Ridge section of La Salle County; Flanagan to Chenoa section of Livingston County; Cropsey-Gibson City-Rantoul section of Ford and Champaign Counties. Losses to corn and soybeans heavy throughout this area, and to lima beans in Gibson City-Rantoul section. Hailstones size of marbles to golfballs, with irregular stones size of lemons in LaMoille section.
Illinois, central portion	9-10	4:20 p.m.-12:15 a.m.					400,000		Wind	Severe windsqualls struck several communities, most severe of which unroofed City Hall at Kewanee, and caused widespread tree, power line, and telephone line damage. Similar tree and line damage reported from Armington, Bloomington and Danville.

See footnotes at end of table.

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Vernon County, Wis.	9	P.m.					$40,000	$110,000	Hail	Damage described as "light" to "heavy" on tobacco in Sugar Grove, Weister Creek, La Farge, Hillsboro, and Cashton areas. Tobacco shredded and riddled with holes. Corn stripped of its leaves and ears damaged as kernels were dug up. Hailstones generally size of marbles, with some as large as hens' eggs. Area around Viroqua hardest hit, with estimated damage to tobacco and corn $100,000, to property $25,000. In Viroqua area series of 3 storms occurred from 11 a.m. to 5 p.m. One storm moved eastward, the second westward, and the third northeastward.
Racine County, Wis.	9	P.m.	6	*3			25,000	75,000	Hail and wind	2 hail- and windstorms hit northeastern Racine County as storms moved southeastward from 2:30 to 7 p.m. Hailstones 3/4 inch in diameter; ground three-quarters covered. Truck gardens, orchards, corn, and shocked grain damaged. Considerable damage to windows in numerous communities and farmsteads throughout County; many automobiles and such damaged.
Leeman (near), Wis.	9	P.m.					10,000		Electrical	Lightning struck barn and fire destroyed barn and stored grain. 2 horses also struck and killed by lightning.
Wisconsin, southeastern Counties	9	P.m.							Hail	Series of hailstorms moved through Kenosha, Ozaukee, Washington, Jefferson, Walworth, Waukesha, and Milwaukee Counties during afternoon and early evening doing minor damage to crops and communities. No estimate of damage available, except Walworth County reported approximately $5,000 loss. Hailstones averaged 1/4 to 1/2 inch in diameter, with occasional stones 1 to 2 inches in diameter.
Kaukauna, Wis.	9	4:50-5:20 p.m.	5	*2			50,000		Wind, hail, and electrical	Storm moved northeastward through city. Some small hail observed but damage considered slight. $40,000 damage estimated due to winds, as trees were uprooted, falling on buildings and automobiles; signs and windows also knocked down or in. Lightning struck several buildings and dwellings, doing $10,000 estimated damage.
Concord, Ga.	9	5:30 p.m.	2	800					Wind	2 barns wrecked; lesser damage to other buildings; heavy damage to wire lines and trees. Wind appeared to be straight west to east.
Sheboygan and vicinity, Wis.	9	5:50-6:30 p.m.	20	*5			20,000	80,000	Hail and wind	Severe hail- and windstorm, moving northeastward, did considerable damage to Sheboygan, Cascade, Waldo, and Plymouth areas. Crops stripped, truck gardens laid low, and orchards stripped of foliage by hail and wind. Hailstones size of marbles. Winds observed at 60 m.p.h. by U.S. Coast Guard Station at Sheboygan.
Great Falls, Mont.	9	6:45 p.m.					Considerable		Wind	Gusts up to 79 m.p.h. Damage mostly to trees.
Florence, York, Hampton, and Lancaster Counties, S. C.	9	8-10 p.m.					10,000	5,000	Electrical, wind, and hail	Several houses hit by lightning. Trees blown down, roofs damaged, and power and telephone lines disrupted by wind. Crops hit by hail and wind.
Gary, Lake County, Ind.	9	8:15 p.m.					4,000		Hail	Greenhouse and potted flowers severely damaged by hail. Maximum size of hailstones 1-1/4 inches.
	9									Minor storms also reported at Elberton, Ga.; at Richmond and vicinity, Va.; near Cambridge City, Goshen, and Hobart, Ind.; at Virgelle, Mont.; and at Oak Ridge, Tenn.
West Palm Beach (5 miles west of), Fla.	10	5:32-5:36 p.m.			0	0	0	0	Tornado	Did not reach ground.
	10									Minor storms also reported near Gonzales, Tex., and at Big Stone Gap and vicinity, Va.
Bronson (6 miles southwest of), Mich.	11	A.m.					10,000		Electrical	Lightning and resulting fire consumed barn and contents.
Fort Pierce, Fla.	11	1 p.m.			0	0		0	Tornado	Severe damage to 2 light airplanes. Storm moved eastward.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Downingtown-Norristown area, Pa.	11	Daytime				1			Wind	Sudden squally winds toppled newly erected wall, injuring 1 man in Norristown. Winds damaged trees and wires in Downingtown area.
Scranton area, Pa.	11	Afternoon							Electrical, wind, and rain	Lightning started 1 fire. Gusty winds damaged trees and wires and broke display windows. Heavy rains flooded streets, causing traffic to detour and causing water damage in stores.
Connecticut and Massachusetts (eastern portions), and Rhode Island.	11	Afternoon					$1,500	$1,000,000	Hail	Hail occurred in many parts of these areas. Damage especially heavy in tobacco-growing area of Connecticut east of Connecticut River, including towns of East Hartford, South Windsor, and Manchester. Both outdoor and shade-grown tobacco severely damaged. Property damage mostly to windows and greenhouses. Hailstones averaged ½ inch in diameter.
Marblehead Harbor, Mass.	11	3:15-3:35 p.m.							Wind	A sudden fierce thundersquall capsized some 75 small racing sailboats, but nearby highpowered speed boats rescued all occupants in swift operation. About 100 persons involved in upsets, several of whom suffered from immersion.
Bannock, Power, Custer, and Lincoln Counties, Idaho	11-12							10,000	Hail and electrical	Damage to wheat field just west of Pocatello Airport estimated at $10,000. No other estimates available, although scattered hailstorms affected 3 counties and lightning started 4 small fires on forest lands near Mackay. Near Shoshone, Lincoln County, lightning killed 3 cattle, knocked man off combine, and started 4 range fires.
Hempstead Lake Park, Nassau County, N. Y.	11	P.m.			1				Wind	Child killed by wind-broken tree.
Caribou (9 miles north of), Maine	11	6:27-6:29 p.m.	1	15-35	1	1	9,000	1,000	Tornado	1 person described clouds as having boiling appearance with portions occasionally reaching earthward, but he did not actually see funnel contacting surface. Evidence of skipping along path. 1 home completely demolished, another damaged. 2 barns completely destroyed. Several long strips of potatoes literally dug up and scattered. Storm moved east-northeastward.
Opheim-Larslan, Valley County, Mont.	11	7-8 p.m.	30	*3-4				150,000	Hail	Damage to wheat, barley, and oats. Hailstones size of peas.
Reserve, Sheridan County, Mont.	11	8 p.m.	50	*2				150,000	do	Damage to wheat and barley, some damaged 30 to 90 percent. Hailstones pea size to marbles.
	11									Minor storms also reported 10 miles northeast of Spencer, Wyo.; in Carroll and Poweshiek Counties, Iowa; and 20 miles northeast of Winifred, Mont.
Lambert, Richland County, Mont.	12	2:30 p.m.	30	*8				250,000	Hail	Some fields damaged 75 to 100 percent. Hail up to 3/4 inch in diameter.
Vida (north of), McCone County, Mont.	12	2:30 p.m.	10	*3				15,000	do	Damage mostly to wheat. Hailstones to 3/8 inch in diameter.
Enid (6 miles west and 2 miles north of), Richland County, Mont.	12	3 p.m.					Some	5,000	do	Hailstones to 1 inch in diameter.
Galata, Liberty County, Mont.	12	5 p.m.	6-7	*3-4				50,000	do	
Castle Rock (3 miles north of), Colo.	12	P.m.					18,000	500	Rain	Storm over small area, 4 inches of rain reported in area of greatest intensity. Damage to railroads and highway and some crops.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Black Forest, Colo.	12					1			Electrical	Man struck by lightning but recovered.
Vermilion, Erie County, Ohio	12	Evening	Short	Narrow	0	0	$500	$0	Tornado	Very small tornado which witnesses reported seeing funnel strike several times in very short distance. Only damage was to 2 trap net racks; 1 lifted out dropped into river while other landed on fish boat. No other reports.
	12									Minor storms also reported at Penrose and near Lime, Colo.; and at Buffalo, and west of Big Sandy, Mont.
Keystone, Keith County, Nebr.	13	1 p.m.			0	0		0	Tornado (possible)	House badly damaged. Trees uprooted and lesser, but widespread damage.
Shavano Valley, Colo.	13	2 p.m.						Moderate	Rain	Losses mainly to crops by erosion and debris.
Baker (near) Baker County, Oreg.	13	2:30-5 p.m.		*1					Hail	Fairly heavy hailstorm with stones ranging in diameter up to 1-1/4 inches. Roofs and windows damaged and some vegetation, but only fragmentary reports available.
Loma-Mack area, Colo.	13	5:30 p.m.	2½	*½				16,000	do	Crop losses range from 5 to 30 percent in storm area.
Black Forest, Colo.	13	6:15 p.m.			1				Electrical	Man killed by lightning.
Elwood (near), Gosper County, Nebr.	13	6:45-6:55 p.m.	4	880			3,400	7,000	Hail and wind	Stones 1/2 to 3/4 inch in diameter; ground completely covered.
Lexington (southeast of), Nebr.	13	7 p.m.			0	0	2,000	0	Tornado	Barn destroyed, 2 calves lost. Nearby buildings not damaged.
Broadview (6 to 12 miles east of), Yellowstone County, Mont.	13	7 p.m.	15	*3			Some	500,000	Hail	Hailstones size of marbles.
Roundup (15 miles south of), Musselshell County, Mont.	13		8	*3				15,000	do	Hailstones ½ inch and smaller.
Lakeland, Fla.	13	7:30 p.m.			0	0			Wind	2 light airplanes blown from anchor ropes and tossed onto airport buildings. Planes badly damaged. Other planes tied down nearby escaped damage. Signboards in vicinity blown down.
Buffalo County, Nebr.	13	9-9:15 p.m.	6	Narrow			Little	Considerable	Hail	
	13									Minor storms also reported in northeastern Baker County, Oreg.; near Morland, Kans.; and at Hamilton, Mont.
Coldwater, Comanche County, Kans.	14	4 a.m.					6,000	5,000	Electrical	Sales barn and contents burned.
Stark and Morton Counties, N. Dak.	14	Afternoon	30-40	*3			Small	250,000	Hail	Hailstorm originating east of Badland moved eastward between Gladstone and Heart Butte Dam. Total loss to all standing crops. Hailstones averaged egg size.
Pilot Rock (immediate vicinity of), Oreg.	14	3-4 p.m.	12	*2-5			Slight	4,000	Hail and rain	Fairly severe hailstorm with stones mostly 3/4 inch or less, although some about 1-1/4 inches. Damage largely to uncut grain, gardens, trees and shrubs. Approximately 5 percent of total damage due to erosion in summer fallowed fields.
Windham, Judith Basin County, Mont.	14	4:30 p.m.	4-5	*2				10,000	Hail	Damage to barley and wheat; 20 to 50 percent damage. Hailstones up to golf ball size.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Carson Vicinity, Grant County, N. Dak.	14	6 p.m.					Considerable	Heavy	Hail	Large area around Carson heavily damaged by hail. Damage to crops and buildings, with hail accumulating 2 to 3 inches deep in streets.
Toole County (northwestern corner), Mont.	14	7 p.m.	30	*2				Considerable	do	Hail approximately ½ inch in diameter.
Westby, Sheridan County, Mont.	14	7 p.m.	5	*2			Some	$10,000	do	Hailstones size of marbles and larger.
Allen and Auglaize Counties, Ohio	14	9-10 p.m.					°$60,000		Electrical	4 barns (including stock and stored crops) destroyed by fire.
Stanley, Granville, Antler, and Portal areas, N. Dak.	14	10 p.m.-midnight	100	*50			Considerable	Heavy	Hail, wind, electrical, and rain	Numerous heavy hailstorms. Damage mostly to crops, but also considerable damage to telephone and power lines, car windshields, buildings, etc. Lightning damaged grain elevator. Total precipitation estimated at 1½ to 3 inches, with some areas estimating 1 inch of rain in 15 minutes. Considerable hail on ground 12 hours later.
	14									Minor storms also reported in northern and eastern Iowa, and at Vinland and near Alta Vista, Kans.
Stanford, Mont.	15	12:30 p.m.	20	*8				2,500	Hail	Damage light as this area was hailed out in July. Hailstones size of walnuts.
Prairie County (northern portion), Mont.	15	Afternoon						Considerable	do	Damage up to 100 percent, but most fields harvested. Destroyed range grass.
Brusett (5 miles northwest of), Garfield County, Mont.	15	Afternoon	20	*8			Some	50,000	do	Hailstones pea size.
Danvers-Christina-Hilger, Fergus County, Mont.	15-16	P.m. both days	30	*6			Considerable	600,000	do	Hailstones up to size of baseballs reported. Windows broken; poultry and small animals killed.
Norfolk, Va.	15	P.m.							Wind and rain	Heavy damage.
Turbeville, Halifax County, Va.	15	2:30 p.m.			0	0			Tornado and hail	Hail damage to tobacco.
Nash, Franklin, Durham, Vance, and Wake Counties, N. C.	15	3-5 p.m.					10,000	70,000	Hail and wind	Tobacco destroyed in fields. Wind damaged power and telephone lines, roofs, and antennas.
Liberty, Pickens County, S. C.	15	3 p.m.					10,000	6,000	Wind and hail	Roofs, awnings, antennas, and garages damaged or destroyed by wind. Crops hit by hail and wind.
Swift Falls (vicinity of), Swift County, Minn.	15	3:15 p.m.	8	Narrow	0	0	25,000	0	Tornado (possible) and rains	All buildings on a farm except house demolished. Small buildings on a number of farms wrecked. Many trees uprooted. Homes, barns, and other buildings damaged. Funnel-shaped cloud observed by several farmers. Storm moved southeastward, accompanied by heavy rains.
Willmar, St. Cloud, and Minneapolis (vicinities of), Minn.	15	3:15-9 p.m.				1	60,000	25,000	Wind, hail, rain, and electrical	A number of outbuildings, silos, and windmills demolished; many farm and town buildings damaged; antennas, poles, and wires downed. Trees uprooted or branches broken off; cow killed by falling tree. Corn badly lodged. At Willmar, winds up to 75 m.p.h. recorded unofficially. At St. Cloud Airport, winds up to 60 m.p.h. recorded in connection with

See footnotes at end of table.

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Wilmar, St. Cloud, and Minneapolis (vicinities of), Minn. (Cont'd.)										severe linesqualls in that area. Storm moved southeastward accompanied by heavy rains and hail in places. Electrical damage $5,000; crop damage by hail. Some hailstones up to golf-ball size.
Little Rock Lake vicinity, Benton County, Minn.	15	4:30 p.m.	1	100	0	1	$25,000		Tornado (possible) and rains	Extensive damage to lake cottages and farm buildings. Heavy rains accompanied storm which moved eastward. On west shore of lake boat found several hundred yards inland from shore; a pump was pulled out of well casing and debris found strewn around in usual counterclockwise fashion.
Abingdon and vicinity, Va.	15	6-7 p.m.	7	*½			1,000	$10,000	Hail	Damage to tobacco.
New Richmond and vicinity, Wis.	15	6-7 p.m.	6	*6	0	0	70,000		Tornado (possible) and hail	People in area described storm as combined effect of actually 2 storms, as 1 storm came in from northwest and the other from southwest, intersecting over New Richmond then continuing eastward. 3 barns flattened and demolished; 6 barns damaged; 5 farm homes damaged; approximately 8 small outbuildings destroyed; 2 silos knocked down. Some hay and stored grain destroyed by collapsed barns, as were machinery and 2 trucks. Some livestock killed - 6 cows and 11 hogs. Approximately 260 acres of corn stripped by 1/4-inch hail. 1 corncrib deposited on tree 16 feet in air. Milk can rack was attached to 2 trees, 1 tree uprooted and carried away, other tree and rack remained as they were. 2 farmsteads opposite each other showed evidence that storm had tornado characteristics as 1 farmer had his barn and machine shed demolished, his neighbor across the road had minor damage estimated at $400. Dog observed being lifted into air and carried away; animal returned that night around 10:30 p.m.
Davison, Hanson, and McCook Counties, S. Dak.	15	Evening							Wind	Strong winds caused major damage within 3-county area. Most damage to trees and power and telephone lines. Winds reached 70 to 80 m.p.h. at Mitchell where damage heaviest.
Clark, Hamlin, Deuel, Kingsbury, and Brookings Counties, S. Dak.	15	Evening							Hail	Hail size of walnuts damaged large areas of unharvested crops in portions of each of these 5 counties. Hail claims totaled nearly 250 in this area.
Buffalo Rapids, Pleasant View, and Union areas, Buffalo County, Mont.	15	Evening	20	*8				400,000	do	Up to 100 percent crop losses reported.
Brockway-Watkins, McCone County, Mont.	15	7 p.m.	6	*1				23,000	Hail and wind	Hailstones up to 1 inch in diameter. $5,000 wind damage included in total.
Forsyth, Mont.	15	7:45 p.m.	35	*2			2,500	Light	do	Hailstones up to 1 inch in diameter. Most crops were harvested, therefore little crop damage.
Lindsay (6 miles south and east of), Dawson County, Mont.	15	9 p.m.	25-30	*4-6			Some	500,000	Hail	Hailstones 3/4 inch in diameter.
Zero, Prairie County, Mont.	15	9 p.m.		*5-6				10,000	do	Damage to beets, corn, beans, and grain. Hailstones size of marbles.
	15									Minor storms also reported at Neillsville, Wis.; at New Orleans, La.; in Wolfe County, Ky.; in vicinities of Beaver City and Louisville, Nebr.; east of Winifred, at Harlowtown, Hysham, and Pineview, Mont.; at Great Bend and near Kirwin, Kans.; in Ottowa and Sandusky Counties, Ohio; and in southwestern and central, Iowa.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Kootenai, Latah, Lewis, and NezPerce Counties, Idaho	16								Hail	Numerous hailstorms reported; 34 insurance claims filed.
Fruitland, N. Mex.	16	12:40 p.m.	3	*1			$5,000	$5,000	do	Hailstones 1/4 to 3/8 inch in diameter.
Crawford, Venango, and Jefferson Counties southward to Greene, Fayette, Somerset, and Bedford Counties, Pa.	16	1:30-8 p.m.			2	9			Electrical, wind, and rain	Vigorous squall line followed by cold front produced series of active thunderstorms with winds up to 60 m.p.h. and sudden heavy rains (up to 1.5 inches in 30 minutes) lashed this area. Several sections reported 2 separate series of storms occurred several hours apart. At least 3 barns, fired by lightning, burned to ground. Lightning struck a number of churches, radio and TV broadcast stations, and many homes. Near Meadville lineman electrocuted when "live" wire fell across wire fence. In Pittsburgh boy struck and killed by lightning. Elsewhere at least 8 persons temporarily stunned by lightning. High gusty winds uprooted scores of trees and broke limbs from hundreds more, which in turn caused widespread utility line damage. Awnings, antennas, and roofs suffered wind damage in all sections. Chimneys and windows also damaged. Streets and highways blocked by fallen trees and wind- and water-borne debris. Gully-washing heavy rains in many sections. Streets in many sections ran water up to 2 feet deep (some suffered washouts 3 feet wide, 15 feet long); landslides blocked several highways with 2 to 5 feet of mud and rock; basements and many first floors as well as underpasses flooded.
Franklin, Forsyth, and Harnet Counties, N. C.	16	Afternoon					25,000	20,000	Wind and hail	Trees blown on autos and buildings and power lines damaged in Dunn. Crops damaged by hail and wind.
Ohio, northern portion	16	Afternoon			3	8	°200,000		Electrical, winds, and rain	Violent winds (50 m.p.h. some up to 70 m.p.h.) ripped across northern Ohio, close to Lake in very short period (1 to 2 hours) causing huge property and crop damage. Heavy rainfall added much damage. Lightning destroyed several barns and a few homes.
Bushnell (near), Nebr.	16	Afternoon			0	0	10,000	0	Tornado (possible)	Sheep shed 42 x 200 feet, barn, and 2 other buildings leveled. No other data available.
Great Falls, Mont.	16	3 p.m.	14	*2			Some	16,000	Hail	Hailstones about ½ inch in diameter.
Russell, Chouteau County, Mont.	16							Considerable	do	
Shonkin-Ft. Benton-Highwood area, Mont.	16	4:30 p.m.	40-50	*2			Minor	400,000	do	Hailstones up to 1 inch.
Garland (20 miles north and 6 miles south of), Custer County, Mont.	16		40				Some	Considerable	do	2 separate storms same day. Damage to range land in southern Custer County. Hailstones reported size of baseballs. Heavy damage to grass.
Colorado, extreme northeastern portion	16	4:30-6:30 p.m.	30	*10			50,000	300,000	Rain, wind, and hail	Damages severe in some areas, but losses compensated by beneficial moisture.
Franklin County, Pa.	16	4:30-10 p.m.							Wind and hail	Thunderstorm winds with gusts to 60 m.p.h. blew across Franklin County generally from northwest. 7 large plate-glass windows blown in, hundreds of trees broken or felled by winds, and in turn damaged utility lines. Over 2,000 users of power without service for periods up to several hours. $7,000 storage shed flattened. Many telephones out of service. Most damage concentrated in Eden-

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Franklin County, Pa. (Cont'd.)										ville-McCord section and in Quincy-Tomstown-Fairview area. Hail left over 5,000 bushels of peaches on ground at orchard, flattened corn and alfalfa on another farm, and did lesser damage to windows, gardens, and trees. Many roads blocked by debris.
Grand Cane, Desoto Parish, La.	16	4:45 p.m.	4	100	0	0	$10,000	$0	Tornado	Destroyed 2 buildings, blew down trees, and disrupted power lines. Skipping type; moved toward north and northwest.
York, Dauphin, Lancaster and Lebanon Counties, Pa.	16	5-8 p.m.				3			Wind and electrical	In Harrisburg, strong winds (with gusts to 57 m.p.h) felled 750 feet of power lines and telephone cables, felled trees, and damaged other utility lines. Mechanic injured when winds blew hangar door shut. Series of thunderstorms which moved across area caused much minor damage by lightning and wind damage to trees, utility lines, and transformers. At Mount Joy, tree fell across auto and chimney toppled. In Lancaster 2 persons injured and 55 m.p.h. winds blew over small building and damaged others. In Lebanon County 3 homes suffered $2,000 damage from fallen trees, and a number of awnings ripped.
Iowa, northern and eastern portions	16						24,800		Electrical	Burned farm buildings and contents and damaged electrical equipment.
Falling Waters, W. Va.	16	5 p.m.			0	0		0	Tornado	Funnel cloud moving to south.
Parsons, W. Va.	16	P.m.			0	0		0	do	Press dispatch reports twister; 2 buildings damaged.
Delaware, northern portion	16	P.m.				1			Wind	Miscellaneous damage.
Unionville, Md.	16	P.m.							Wind and hail	Listed as very damaging.
Hardin-Crow Agency, Mont.	16	6 p.m.	5	*1			Some	20,000	Hail	Hailstones up to size of baseballs.
New England, northern and central portions	16	All day							Wind	Winds, attending rapidly moving cold front across New England, reached gale speeds in many parts. Major damage from blown-down trees which carried electric wires with them, or from trees blown onto dwellings and other buildings.
Ware, Hampshire County, Mass.	16	7:45-8:10 p.m.	2	35	0	0	4,000	0	Tornado	Funnel of tornado reportedly seen by a number of persons. Storm moved southeastward. It damaged trailer-type home and felled trees onto electric wires, disrupting light and power service on some circuits.
Culloden, Monroe County, Ga.	16	10:30 p.m.			0	0		0	Tornado and electrical	1 dairy barn blown away, and another destroyed by lightning-set fire. 2 garages demolished and a third picked up above parked automobile and deposited 50 feet away, apparently undamaged.
Oberlin, Decatur County, Kans.	16	11:15 p.m.					12,000		Electrical	Church burned.
	16									Minor storms also reported at Macon Ga.; at Hammond, Hogeland, and Dutton, Mont.; at Fairmount, Rowlesburg, and Weirton, W. Va., and at Merrill and in Frederick and Washington Counties, Md.; at Winfield, La.; near Milroy, Pa.; and in Marion County, Ky.
Pickens, Horry, Edgefield, Charleston, Aiken, Greenville, and Allendale Counties, S.C.	17	1 p.m.					12,000	1,000	Wind	Homes and business buildings damaged, trees felled, power lines knocked out, and signs blown down.
Vidalia, Ga.	17	Afternoon				2	15,000		do	Warehouse partly unroofed.
Travis Airport, Savannah, Ga.	17	2:30 p.m.							do	Gusts to 75 m.p.h. damaged 4 airplanes, ripped tents, and damaged roofs.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Cumberland, Hoke, Yadkin, Randolph, Durham, and Surry Counties, N. C.	17	3-5 p.m.			1		$50,000	$25,000	Wind, electrical, and hail	Several homes damaged. Power lines downed. Man killed by lightning. Crops damaged by hail and wind.
Staley, Randolph County, N. C.	17	3:30 p.m.					150,000		Tornado	Brick building occupied by Staley hosiery mill destroyed. Several homes damaged. No reports on wind characteristics or tornado effects.
Augusta, Ga.	17	3:30 p.m.			0	0	10,000	0	do	Wrecked auto repair shop and private garage. Damaged homes and broke trees in west to east path.
Baxley, Ga.	17	5 p.m.	**900		0	0		0	do	Unroofed 2 warehouses, broke windows and trees, and damaged roofs in east to west path.
Bakerville area, Ariz.	17	5:45 p.m.	**70	30			2,500		Hail, wind, and rain	Wind damage to buildings, signboards, tent, and other property. Only minor hail damage. Maximum size of hailstones 1 inch in diameter. Moved north-northwestward.
Circle (northwest of), Mont.	17		10-15	*1½				20,000	Hail	Hailstones about ½ inch in diameter.
	17									Minor storms also reported at Power and west of Glendive, Mont.; in Jenkins County, Ga.; at Troy, Ala.; at Omaha and Lincoln and in Colfax County, Nebr.; and in central and southern Iowa.
Henderson County, Ky.	18	1 a.m.					50,000	50,000	Wind and electrical	Storm wrecked part of new high school, set fire to homes and farm properties, disrupted power and telephone services, uprooted large trees, and destroyed farm crops. Several cars damaged. Greatest crop damage to tobacco, corn, and peach trees. 90 percent of damage by the wind.
Ohio, northwestern and north-central portions	18	10-11 a.m.				Few	°75,000		Electrical, winds, and rain	Winds 60 m.p.h. and heavy rainfall, plus sharp lightning which started fires damaged many small airplanes; several barns and a few houses destroyed by fire.
Newton and Claremont areas, Catawba County, N. C.	18	3 p.m.					50,000		Tornado	So described by press. 1 building moved 400 feet. Roaring heard in cloud.
Greenville, Laurens, and Greenwood Counties, S.C.	18	4 p.m.					15,000		Electrical and wind	Home burned by lightning. Houses, trees, and fishing pier damaged by wind.
Southeastern Pottawatomie, northern Shawnee, and southwestern Jefferson Counties, Kans.	18	4 p.m.	20	*4		1	5,000	30,000	Hail and wind	Swaths of total crop damage from wind-driven hail up to golf-ball size. several small buildings demolished and telephone poles snapped off by wind.
Birmingham, Ala.	18	4 p.m.				1	2,500		Electrical and wind	Heavy thunderstorm did some damage to buildings, trees, and automobiles and considerable damage to power facilities. Man stunned by lightning.
Montgomery, Ala.	18	P.m.				1			Electrical	Lightning struck apartment house in south Montgomery, shocking sleeping woman.
Detmold to Kiel, Franklin County, Mo.	18	Late afternoon	Short	Narrow	0	0	7,500		Tornado	Small tornado caused damage to 5 farmsteads. Several persons reported seeing funnel cloud.
Missouri, northeastern and east-central portions	18								Winds	Numerous windsqualls. Near St. Charles 3 planes damaged.

See footnotes at end of table.

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Adams County (northern portion), Ind.	18	Evening					$25,000		Electrical	Large barn and other buildings containing 3 head of cattle, 600 bushels wheat, 500 bushels oats, 25 tons of hay, 100 chickens, farm machinery, etc., completely destroyed by lightning-set fire.
Marion and Chase Counties, Kans.	18	6:30 p.m.	9	50	0	0	3,000	$0	Tornado	Tornado first seen 3½ miles southwest of Florence; moved due eastward into Chase County. Damage to barn and oil storage tank at west end of path and to farmstead at east end.
Illinois, central portion	18	7:30-11:30 p.m.			3	10	1,500,000		Wind and electrical	Series of windsqualls caused extensive tree damage, breaking power and telephone lines in many communities. Most severe of these squalls occurred within 20-mile strip extending from Pittsfield-Griggsville section in west to Georgetown-Danville section in east. 3 deaths caused by downed power lines. At State Fair in Springfield tents overturned. Radio tower blown down south of Springfield. Near Beardstown barn struck by lightning and burned. Of injured 5 were in a car at Quincy when large tree toppled over; 3 in roller rink tent at Jacksonville when it was blown down and other 2 in Springfield.
Eads, Colo.	18	8:30-11 p.m.	15	*4		1	200,000	15,000	Wind, rain, hail, and electrical	Storm moved southeastward. Hail accompanied by high winds, lightning, and torrential rain; hailstones to size of golf balls and hens' eggs. Damages greater to buildings and automobiles. 1 person injured by flying glass. Precipitation up to 4 inches reported in some areas.
Iowa, Central and eastern portions	18						17,500		Electrical	Burned farm buildings and contents.
Covington, Boone County, Ky.	18						°10,000		do	Barn and contents, including tractor, other farm tools, hay, and wheat destroyed by fire after being struck by lightning.
	18									Minor storms also reported in Jackson and Clinton Counties, Iowa; in Adair County, Mo.; at Francesville, Mt. Vernon, Spencerville, and Auburn, Ind.; and 4 miles east of Bradenton, Fla.
Noblesville, Hamilton County, Ind.	19	12:30 a.m.					40,000		Wind	100 trees blown down; power lines downed; 2 large smokestacks blown down; 6 homes and 5 automobiles damaged by falling trees. Electric signs damaged. In nearby rural areas 2 barns, a windmill, and 2 or 3 smaller buildings flattened.
Ft. Wayne, Allen County, Ind.	19				1	2			Electrical	1 man killed and 2 others critically burned when struck by lightning on golf course.
Lake Village, Ark.	19	Afternoon					30,000		Wind and electrical	Wind damage principally to warehouse--also to several barns and service stations with losses estimated at $29,000. 1 small house struck by lightning, burned to ground with loss estimated at $1,000.
Greenway (near), Clay County, Ark.	19	2-3 p.m.	2	*1			500	19,500	Hail	Most damage to cotton, soybenas, and rice.
Gordon and vicinity, Nebr.	19	3-3:45 p.m.	20	*5			100,000	110,000	do	Stones 1 to 4 inches in diameter, cover ground 2 to 3 inches.
Burke County, N. C.	19	3 p.m.					10,000		Wind	3 autos crushed by falling tree.
Murray, Calloway County, Ky.	19	3:30 p.m.					1,500		Wind and tornado (possible)	Damage mostly to television aerials, roofs, and drive-in theatre screen. Damage to screen may have been caused by very small tornado.
Franklin and Mifflin Counties to Lackawanna and Monroe Counties, Pa.	19	3:30-9 p.m.				1			Electrical, wind, and rain	Squall line series of thunderstorms. At least 4 barns struck by lightning and completely burned. Loss from 2 of them estimated at $26,500. Loss at third fire estimated at $15,000. Lightning also struck several churches and houses, damaged transformers and wires, and caused $2,500 damage to an Easton house. High winds up to 50 m.p.h. damaged roofs, trees, utility lines, TV antennas, windows, bandshell, and other small buildings. Felled trees and wires blocked streets. At least 2 autos caught under fallen trees. Heavy rains (up to 1.1 inches

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Franklin and Mifflin Counties to Lackawanna and Monroe Counties, Pa. (Cont.)										in 45 minutes) sent small creeks over their banks at several points, temporarily flooded low spots on streets and highways, flooded many fields, and brought mud and rocks across some highways.
Cave City, Sharp County, Ark.	19	4-4:30 p.m.	2	440		1	$1,000		Wind	
Craighead County, Ark.	19	5:30-9:30 p.m.	25	*15			35,000	$5,000	Wind, hail, and electrical	Wind damage to school, gin, church, and many houses and barns, especially in Dixie Community near Monette. Several farms in County suffered one-half to three-fourths loss of crops by hail. 1 house struck by lightning, burned to ground.
Unionville, Md.	19	P.m.							Wind	Listed as very damaging.
Queen Creek and Ray-Superior areas, Ariz.	19-20						200,000	300,000	Rain	Heaviest rain occurred in mountains draining into Queen Creek (normally dry with indefinite channel through flat areas downstream) early on 19th; additional rain recorded early on 20th. Rainfall ranged from 4 to 6 inches. Crop damage mostly to cotton. Damage reported to roads and ditches. Railroad trestle in Superior heavily damaged. Estimate 16,000 acres of maturing cotton damaged by flooding.
	19									Minor storms also reported at Washington and vicinity, D.C., and at Baltimore and Westminster, Md.; in Randolph County, Ark.; in Christian, Trigg, and Muhlenberg Counties, Ky.; at Anderson, Bluffton, Burnettsville, and Logansport and vicinity, Ind.; in Garfield, Columbia, and Asotin Counties, Wash.; at Clarksville, Tenn.; at Carlton, Tex.; at Mullinville and Fall River, Kans.; at Dinsmore, Fla.; and in Page County, Iowa.
Dry Ridge, Grant County, Ky.	20	5 a.m.					°10,000		Electrical	Lightning set fire to 2 barns, destroying barns and large quantity of hay in them.
Ripley, Ohio	20	6 a.m.					50,000	50,000	Hail and wind	Strong winds and severe hail riddled burley tobacco crops, flattened corn, blew down barns, and unroofed many buildings on numerous farms.
Wilmington and vicinity, Del.	20	4 p.m.				1			Wind, rain, and electrical	Miscellaneous damage.
Warwick and York Counties, Va.	20	P.m.				1			Electrical and wind	
Montrose, Colo.	20	P.m.					Moderate	Moderate	Rain and hail	Damage mostly to tender row crops.
Cleveland, Greene, Madison, Durham, Wake, and Randolph Counties, N. C.	20	5-10 p.m.					15,000	45,000	Hail and wind	Tobacco damaged in fields. Raleigh-Durham Airport terminal and farm buildings damaged by wind.
Coffee Creek, Fergus County, Mont.	20	5:30 p.m.	15	*5				Moderate	Hail	Hailstones pea size to marbles.
Joplin (northeast of), to Kremlin (north of), Liberty and Hill Counties, Mont.	20	6 p.m.	30	*3				900,000	do	Hailstones to 1 inch in diameter.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Pass-A-Grille, Fla.	20	6:54 p.m.	**500	25	0	0	$10,000	$0	Waterspout	Spout formed about 300 yards offshore in Gulf of Mexico, drifted southward and then eastward onto shore to damage a hotel building.
Barnegat, N. J.	20				1				Electrical	Man struck and killed by lightning while digging clams.
Wainwright, Alaska	20								Wind	On 20th strong winds from southwest broke anchor lines on motorboat, washing it in on beach at lagoon. Boat total loss, but motor saved.
New Mexico, south-central and southeastern portions	20- through 25								Rain	Widespread heavy showers, heaviest in Roosevelt County. 24-hour totals exceeded 3 inches and storm totals exceeded 9 inches. Considerable damage from flooding in several communities.
Ulysses (10 miles southwest of), Grant County, Kans.	20				0	0	0	0	Tornado	Funnel cloud traveled northeastward.
Plum Creek and Cherry Creek Drainage, Colo.	20-21	9 p.m.-midnight					88,200	2,500	Rain	Damage mainly to roads, highways, and farms adjoining creeks.
	20									Minor storms also reported at Mechanicsville and Tye River, Va.; 5 miles south of Four Corners, Wyo.; at Philadelphia, Pa.; and at Buxton, Kans.
Oracle (7 miles southeast of), Ariz.	21	12:50 p.m.	5	*5			6,000		Hail and rain	Hail damage to roofs, automobiles, property and equipment. Maximum size of hailstones 1-1/4 inches.
Tampa Bay, Fla.	21	1:30 p.m.				2			Wind	Storm described as "sudden squall" upset more than 50 small boats in Tampa Bay and Manatee River.
Weeping Water (1 mile northwest of), Nebr.	21	4-7 p.m.				2	1,500		Electrical	Barn set on fire and burned.
Wibaux County, (northern portion) Mont.	21	4 p.m.	15-20	*8				Moderate	Hail	Hailstones 1/4 to 3/4 inch in diameter.
Shoshone, Lincoln County, Idaho	21	4:30-5:30 p.m.				1			Hail and rain	Up to one-third of grain crop damaged in some fields north of town. Heavy rains preceded hail in some places.
Kansas, extreme northeastern portions	21	7 p.m.					25,000	3,000	Electrical and wind	3 large barns and contents and schoolhouse burned. Considerable unestimated wind damage.
Hutchinson, Reno County, Kans.	21	Night					15,000		Wind	Corrugated steel building destroyed.
	21									Minor storms also reported in southwestern Iowa; near Evergreen, Colo.; and at Topeka, Kans.
Wuthrich Hill Community (8 miles northeast of Taylor), Williamson County, Tex.	22	2:15 p.m.				2			Wind	3-room house demolished, and other buildings damaged.
Iowa, western and central portions	22						32,075		Electrical	Destroyed farm buildings and contents.
Everly, Clay County, Iowa	22	3:30 p.m.	2½	200	0	0	10,000		Tornado	Destroyed farm buildings and crops.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Jewell, Jewell County, Kans.	22	4 p.m.	2	800	0	0	$15,000	$0	Wind and tornado	Numerous barns and other farm buildings unroofed and damaged.
Crete, Nebr.	22	4:15-4:25 p.m.	3	200	0	0	5,500	0	Hail, wind, and tornado (possible)	Funnel cloud reported observed by many persons. Hailstones up to 3/4 inch in diameter. Hail damage $2,000, wind $3,500.
Cairo (2 miles south of), Nebr.	22	9:30 p.m.							Electrical	Barn struck and burned. Considerable equipment also destroyed.
	22									Minor storms also reported in Blair and Lincoln, Nebr.; at Austin, Tex.; and near Blue Rapids, Kans.
Hutchinson (near), Reno County, Kans.	23	Afternoon				1			Electrical	Man injured by lightning strike.
Ionla, Jewell County, Kans.	23	2 p.m.			0	0	0	0	Tornado	Tornado funnel dipping down from clouds, but not reaching ground, observed by an individual southeast of Ionia; also seen by motorists along Beloit-Mankato Highway. Moved northward or north-northeastward.
Huntsville, Ala.	23	5 p.m.					12,000		Wind	1 business building leveled, another lost its roof, and several suffered lesser damage.
Salina (10 miles northwest of), Saline County Kans.	23	5:45 p.m.			0	0		0	Tornado	Approaching funnel seen and evaded by motorists; shed destroyed.
Austin, Travis County, Tex.	23	6 p.m.			1				Electrical	Woman killed by lightning. Power lines knocked out.
Oak Grove (near), West Carroll Parish, La.	23	6 p.m.			0	0	15,000	0	Tornado	Moved to northwest. Homes and barnes destroyed or damaged. Evidence of lifting action when buildings raised up and shattered.
	23									Minor storms also reported at New Orleans and Lake Providence, La.; at Maysville, Ky.; at Lordsburg, N. Mex.; and in vicinity of Salina, Kans.
Lexington, (5 miles south of), Mich.	24	Afternoon			0	0	0	0	Waterspout	At Birch Beach, waterspout observed 2 miles out in Lake Huron. Moved eastward.
Michigan, southern portion	24	Afternoon							Electrical	Lightning and resulting fire destroyed barns near Kalamazoo, Coldwater, Clayton, Hartford, and Bellevue. Reported loss $10,000 at Kalamazoo, and $5,500 at Coldwater. At Grand Rapids 2 buildings and contents damaged in like manner, with loss estimated at $5,300.
Ohio, northern portion	24	Afternoon			1		°10,000		Electrical, winds, and rain	Series of thunderstorms lashed area causing considerable property and some crop damage.
New York, northwestern portion	24	2-4 p.m.			2		40,000	15,000	Electrical, wind, hail, and rain	Thunderstorms which left $1,000,000 damage in Niagara Falls, Canada area, hit New York State hardest from Niagara Falls eastward along Lake Ontario to Rochester. Rain flooded household basements and industrial plants. Several farm buildings with contents burned by lightning and many cattle killed. A mother and son killed by lightning near Rochester. Utility service disrupted by rain and wind-broken lines. Hailstones ranging to 1 inch in diameter reported in parts of Niagara County; apples, peaches, grapes, and prunes damaged.
Simpson County, Ky.	24	3:30-5 p.m.					1,000	15,000	Hail, wind, and electrical	Greatest damage to crops, livestock, and a few buildings. Hail damage $10,000, wind $5,000, and lightning $1,000.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons: Killed	Number of persons: Injured	Estimated damage: Property (exclusive of crops)	Estimated damage: Crops	Character of storm	Remarks
Flint, Mich.	24	4 p.m.	1-3/10	10	0	0		$0	Tornado	Very small tornado, much like long column of smoke, seen to break window and shatter garage along Coldwater Road. Couch in garage lifted and carried 200 feet. Other debris found 500 feet away. Moved eastward.
Susquehanna and Bradford Counties, Pa.	24	5-8 p.m.							Electrical, wind, and rain	In susquehanna County, lightning killed 7 cows and seriously injured another cow, losses estimated at $2,000. High winds damaged trees and littered streets with debris. Lightning caused $300 damage to cottage. In Bradford County, 2 barns burned after being struck by lightning, and 1 house set afire. Near cloudburst rains flooded streets more than curb deep in Sayre.
Richmond, Wayne County, Ind.	24	5:15 p.m.				1	$25,000		Wind and electrical	End of large concrete block storage garage blown out, with heavy damage to bus parked nearby. Trees and power lines downed. Other buildings damaged by falling trees. Man injured when struck by lightning.
Liberty, Union County, Ind.	24	Evening					15,000		Electrical	Barn, 5,000 bales of hay, 16 tons of fertilizer, and large amount of feed destroyed by lightning.
Berwick, Pa.	24	Evening				2			do	Lightning, "like a ball of fire about as big as a car", struck tree, burned off wires, exploded light bulb, melted socket, hurled man to ground stunning him, temporarily blinded and deafened woman, and did other damage in house.
Pennsylvania, western portion	24	Evening			1	3			Electrical, rain, wind	In Venango County girl killed by lightning and another child stunned. In Pittsburgh small boy carried under parked car by rushing waters before being rescued. Lightning started several small fires. Gusty winds felled trees, damaging parked auto. In Aliquippa blocked sewers and heavy rain resulted in street cave-in which blocked traffic and caused hill to collapse. In Connellsville lightning struck house, damaging it and contents to extent of $500. In Bradford, lightning set fire to store and to house. 1 man overcome by smoke fighting fire. In Crawford County, lightning set at least 4 farm fires; barn and garage burned completely, other buildings damaged.
Hobbs, N. Mex.	24	P.m.					22,250		Winds	Winds up to 85 m.p.h. did considerable damage to hangar and planes.
Elida (7 miles northwest of), N. Mex.	24	8 p.m.			0	0			Tornado	Funnel cloud not observed, but evidence of tornado action was path of debris. Pickup truck lifted and carried around house. 3 farms affected.
Pipestone, (10 to 15 miles north of), Minn.	24	11:15-11:45 p.m.			0	0	0	0	Tornado (possible)	Patrons of a drive-in theatre left early as precautionary measure when employees of theatre observed 2 tornado-like clouds against background of severe lightning which was almost continuous. Clouds which resembled funnels seemed to form 1 after another. Apparently, funnels did not descend to earth as they moved eastward.
	24									Minor storms also reported at Hammond, Ind.; and in eastern Iowa.
Thurston (2 miles east of), Nebr.	25	4 a.m.			0	0	700	Little	Tornado	Farm buildings damaged. Moved northeastward.
Sutter, Yuba, Butte, and Colusa Counties, Sacramento Valley, Calif.	25-28							3,000,000	Rain	Cool, humid weather accentuared by unseasonal rains from 25th to 28th caused considerable loss of peaches in "Peach Bowl". The expected 200,000 tons reduced to about 150,000 tons. Only appreciable rain damage was to cling peaches, manifested by (a) loosening of ripening fruit at stem causing it to fall and (b) activation and spread of brown rot. Crops other than peaches received little or no damage.
Iowa, entire State	25-26						123,810		Electrical, wind, and rain	Destroyed at least 30 buildings, much of their contents; and a number of cattle; damaged other buildings. Some wind and rain damage also reported from southeast corner of State.
	25									Minor storms also reported in Franklin County, Va.; and in vicinities of Faribault, Browerville, and Clarissa, Minn.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Indianapolis, Marion County, Ind.	26	11:30 a.m.	7	*1/4 to 1			$500,000		Wind	Copper roofing of hospital ripped away. Many windows broken and trees downed in this area. Many trees and power lines downed. Scattered other damage in path. Extensive damage in west-northwest outskirts of city to drive-in theatre and to airport installations. Greater portion of asbestos siding of drive-in theatre fence broken and blown outward on east side and blown outward in opposite direction on west side. North and south sections of fence remained mostly intact. Hangar doors blown off. Damage to other buildings. No evidence of explosive effect or pressure damage. Difference in direction of wind damage may have been caused by by wind shift rather than from rotating type of storm.
Burke County, N. C.	26	1 p.m.			1				Electrical	Boy, carrying shovel, killed by lightning near Morganton.
Lewis, Nez-Perce, and Idaho Counties, Idaho	26	Late afternoon							Hail, wind, and rain	Principal damage in Camas Prairie area where damage to pea crop ranged from 15 to 60 percent, to barley 10 to 40 percent, and to wheat 5 to 30 percent.
Vida (12 miles southwest to 2 miles northeast of), McCone County, Mont.	26	4:30 p.m.	15	*1-1/4	0	0	150,000	$95,000	Tornado, hail, and wind	$20,000 damage to crops from wind. Hail up to 3/4 inch in diameter. Moved northeastward.
Ponca City, Okla.	26	6:30-7 p.m.					10,000		Wind	Extensive damage throughout city; winds from south-southwest at 50 to 60 m.p.h. with gusts up to 75 m.p.h.
Munsey Park, Nassau County, N. Y.	26				2				Electrical	2 men seeking shelter under tree killed by lightning.
	26									Minor storm also reported at Sunnyside, Wash.; near Centralia, at Louisburg, and in Shawnee Township, Kans.; at Louisville, Ky.; and at Middlebourne, W. Va.
Port Aransas (8 miles south of), Nueces County, Tex.	27	10:10 a.m.			0	0	0	0	Waterspout	
Cumberland, Yadkin, and Guilford Counties, N.C.	27	Afternoon					10,000	10,000	Electrical and hail	Home burned by lightning; other buildings damaged. Crops hit by hail.
Nelson County, Ky.	27	9 p.m.					22,000	30,000	Wind and hail	Trees by the score felled, buildings unroofed, power lines torn down, and large amount of tobacco destroyed or damaged. Three-fourths of city of Bardstown without electric current.
Elizabeth City Pasquotank County, N. C.	28	1:20 a.m.			1				Electrical	Textile workman killed at machine by lightning.
Cabarrus, Cumberland, Randolph, Stanly, Henderson, Rockingham, and Moore Counties, N. C.	28	Afternoon				2	20,000	20,000	Electrical and hail	2 Aberdeen men hit by lightning also several buildings struck. Crops damaged by hail.
Jefferson, Columbia, Alachua, and Orange Counties, Fla.	28	Afternoon and evening	200	*40	1	Several		Slight	Electrical, wind, rain, hail, and tornado	Numerous thunderstorms. Hail fell in Alachua and Orange Counties. Tornado cloud reported to have dipped to ground momentarily in Orlando and ripped up 3 large oaks. Child struck by lightning at Lake City. Property damage due mostly to wind and lightning. Trees, wire lines, and TV antennas downed in many areas. Considerable wind damage to roofs. Several automobiles caught by falling trees. Crop losses slight, and rains generally very beneficial.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Calico Rock (2 miles east of), Ark.	28	2:30 p.m.			1				Electrical	Man killed by lightning while closing windows in his house.
Cullman (near), Ala.	28	P.m.			1	1			do	Farmer killed by lightning as he walked from barn to house. His son knocked unconscious.
Jasper (near), Ala.	28	P.m.							Wind	High winds caused considerable damage northeast of Jasper during afternoon. High school building at Curry rather badly damaged; trees blown down; rear end of hangar at Jasper airport blown down; and house just west of airport blown off its foundation.
Richmond County, Ga.	28	5 p.m.				7	$50,000		Electrical and wind	1 injury due to lightning, others due to wind. Property damage largely due to wind. Trees, wire lines, roofs, windows, and automobiles bore brunt of storm.
Greensboro, Guilford County, N. C.	28	6 p.m.			1		5,000		Rain	Child drowned in flash flood. P.O. Substation flooded; other light damage.
	28									Minor storms also reported at Valdosta, Ga.; at Cleveland, Tenn.; at Talihina, Okla.; and at Cherryvale, Kans.
Matagorda Island (20 miles east of), Matagorda County, Tex.	29	12:45 p.m.			0	0	0	$0	Waterspout (unconfirmed)	Moved north-northwestward.
McPherson, McPherson County, Kans.	29	2 p.m.			0	0	0	0	Tornadoes	3 small tornado funnels reported in vicinity of McPherson, moving northeastward; 1 dipped to ground west of airport, causing no damage.
Natchitoches (near), Natchitoches Parish, La.	29	2:30 p.m.			0	0	10,000	0	Tornado	Within area of thunderstorms. Several buildings damaged; power poles twisted off above ground; trees damaged. Thunderstorms occurred over most of southern 3/4 of state that day, but damage in most areas minor in nature.
Samstown, Iberville Parish, La.	29	3:15 p.m.			0	0	15,000	0	do	4 homes destroyed and several damaged. Evidence of lifting action. Probably developed in thunderstorm which caused damage at Donaldsonville.
Franklin, Crawford County, Kans.	29	3:30 p.m.			1	1			Electrical	Boy struck by lightning while climbing tree and girl injured.
Butte County (eastern portion), Nebr.	29	4-4:30 p.m.	6	*1-1½				3,000	Hail	Stones marble to egg sized. Ground about one-half covered.
Missouri-north-central portion	29	4:15-4:30 p.m.			1				Wind	Most severe damage between Trenton and Chillicothe where trees uprooted, buildings unroofed, windows blown out, and 294 panes of glass broken in 1 greenhouse; winds estimated at 90 m.p.h. 1 person electrocuted by broken power line.
Newcastle, Wyo.	29	5-5:10 p.m.	7	*2				1,000	Wind and hail	Damage entirely to crops. Stones to 1-1/4 inch in diameter; depth on ground 2 inches.
Hobart (8 miles southwest of), Okla.	29	Evening					10,000		Wind	Damage to farm buildings on 1 farm.
Dallas, Dallas County, Tex.	29				1				Electrical	Lightning killed man on golf course.
Missouri, southeastern portion	29	9-10 p.m.							Wind	Most extensive damage to trees and communication lines reported from Perryville.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Ben Lomond to Lockesburg, Sevier County, Ark.	29	10:30 p.m.	7	30	0	0	$18,000	$0	Tornado	Tornado, moving northeastward, dipped down 4 times in 7 miles. American Red Cross reported 2 homes and 6 other buildings damaged.
	29									Minor storms also reported at Waxahachie, Tex.; east of Geary, Okla.; at Iola, Kans.; and at Donaldsonville and Baton Rouge, La.
Frederick (3 miles northeast of), Okla.	30	1:30-1:32	**200	300	0	0	500	0	Tornado	Tornado observed by several persons.
Dallas, Dallas County, Tex.	30	1:40 p.m.	2	*2	1	1	75,000		Wind, hail, and electrical	Trees, power lines, and telephone poles snapped. 1 person killed by lightning. Light plane overturned. Windows blown out. Neon signs and awnings torn down. Accompanied by light hail. Localized damage in North Dallas and Park Cities. Moved northwestward.
Calvin, Okla.	30	2-2:20 p.m.	6	440	0	0	1,000	0	Tornado	Several buildings suffered minor damage. Path southeastward.
Abilene, Taylor County, Tex.	30	2:51 p.m.							Dust Devil	
Monroe and West Monroe, Ouachita Parish, La.	30	3 p.m.					40,000		Wind	Thunderstorm covered most of Parish and surrounding areas. 1 home demolished in West Monroe, but occupants uninjured; wall of hangar blown down and 5 small airplanes scattered over airport and damaged with 1 wrapped around tree. Winds of 50 m.p.h. for 5 minutes and gusts to 83 m.p.h. recorded by CAA station at airport.
Carpenter (3 miles east of), Wyo.	30	3-6 p.m.	4	*1			2,000	10,000	Hail	Some damage to roofs and trees. Principal losses to crops. Stones to ½ inch in diameter.
Fort Worth, Tarrant County, Tex.	30	3 p.m.							Wind	Severely damaged 1 home when shifted from foundation; blew shingles from others and bent TV antennas.
Junction (20 miles southeast of), Kimble County, Tex.	30	3:03 p.m.			0	0	0	0	Tornado	Small tornado did not touch ground.
Cuero, DeWitt County, Tex.	30-31	3:15 p.m. on 30th and 3 p.m. on 31st	10	880			10,000		Wind and hail	Damaged buildings, especially poultry houses and roofs of homes. Moved southwestward. Maximum size of hailstones ½ inch.
Crockett, Houston County, Tex.	30	4:15 p.m.							Wind	Extensive damage to crops, buildings, and trees. 50 homes severely damaged; 70 others less seriously damaged. Moved southward.
Cisco, Eastland County, Tex.	30	P.m.			1				Electrical	Man killed at nightfall when struck by lightning while picking cotton.
Huron (2 miles southeast of), Ohio	30	4:45 p.m.	Short	17	0	0	5,000	0	Tornado and hail	Storm moved south-southeastward off Lake and dipped momentarily on farm destroying portions of farm buildings and killing about 200 chickens. No damage sustained by cornfield that surrounded 3 sides of farmyard. This same farm was hard hit in last year's tornado of June 8, same buildings being damaged a second time. Hail reported about a mile south.
Thompson Falls, Mont.	30	6 p.m.	20	*3			25,000	5,000	Wind and hail	Hailstones size of robins' eggs.
Kootenai, Latah, Nez Perce, Lewis, and Idaho Counties, Idaho	30	Evening				Several			Hail and electrical	Hail damage to unharvested grain fairly heavy. Lightning knocked out several people in Nez Perce and set fire to home, burning out 1 wall.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
North Carolina, coastal areas	30-31	Night					$150,000	$100,000	Hurricane	Fishing piers, roofs, and antennas damaged along most of coastline. Part of highway washed out at Hatteras. Corn and soybeans blown down.
Kalispell, Mont.	30-31	11:45 p.m.					1,000	9,000	Wind	
	30									Minor storms also reported at Box Elder, Mont.; at Kanawha and Woodland and near Gonzales, Tex.; at Valliant, Ada, and Helena, Okla.; at Hagerstown and vicinity, Md., and at Berkeley Springs, W. Va.; in coastal sections of Maryland, Virginia, and Delaware; and at Hatton, Polk County, Ark.
New England	31	Late morning and afternoon			60	1,000	433,300,000	21,250,000	Hurricane	Center of Hurricane "Carol" reached mouth of Connecticut River about 10:30 a.m. Moving on course slightly west of north with average forward speed of about 35 m.p.h., it passed through central Massachusetts and central New Hampshire into Quebec. Storm began to weaken when it reached New Hampshire-Massachusetts boundary. In its magnitude, this storm ranks with the most severe weather occurrences on record for New England. (A much more complete summary is carried elsewhere in this publication and also in "Climatological Data" for New England issues of August 1954).
New Jersey, coastal sections	31				2		250,000		do	Winds with speeds up to 60 m.p.h., flood tides, and heavy rain sent beaches awash from Atlantic City to Sandy Hook. Boardwalks and beach buildings damaged, sea walls broken, and streets flooded by waves that reached 30-foot heights in some sections. Approximately $100,000 damage in Asbury Park area. Wind blew down trees and tangled electric and telephone lines. Man electrocuted while picking up broken electric wire; another killed while repairing storm-damaged electric line.
New York, southeastern portion, and Long Island	31				1	2	4,500,000	500,000	do	High winds and high hurricane tides resulted in severe damage, principally in Suffolk and Nassau Counties on Long Island. Summer homes crumpled, sea coasts and harbors littered with splintered boats, residences and factories flooded, and towns and cities without electricity and telephones. Man died from overexhaustion while 2 were injured by falling trees. Wind speed of 102 m.p.h. for 4 minutes reported at MacArthur Airport. Tide 4.17 feet above normal at South Beach.
Elkhart, Anderson County, Tex.	31	1:45 p.m.	½	300	0	0	8,000		Tornado	Blew down school building and several small residences. Moved southward.
El Campo, Wharton County, Tex.	31	8:30 p.m.		*10-15					Wind	125 TV antennas blown down; plate glass broken. Awnings and signs ripped down. Roofs damaged. Not much crop damage as cotton almost picked. Moved southward.
Imperial Valley, Imperial County, Calif.	31	During night					500		Electrical, wind, and rain	Power lines and transformers knocked out; roofs torn from buildings; numerous flash floods. Trees downed and TV antennas twisted and bent. Transcontinental lines of Pacific Telephone and Telegraph Company north of Niland knocked out. Some cotton ready for picking blown to ground and young tomato plants damaged. Storm described as worst in 10 years.
	31									Minor storms also reported at Ambler, Pa.; at Live Oak, Fla.; and at Savannah, Ga.

* Miles instead of yards.
** Yards instead of miles.
° Crop damage included with other property damage.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

AUGUST 1954

Record to near-record low stages were reached at several points in the Atlantic Slope drainage and in the southern states east of the Rocky Mountains during August. It was the first time since 1900 that the North Canadian River stopped flowing at Wetumka, Okla. The Lake Fork River at Quitman, Tex., also went dry during the month.

The most significant flooding occurred in the upper Big Blue River in Nebraska and Kansas. Flash floods were reported in West Virginia, Colorado, Utah, and Arizona.

ATLANTIC SLOPE DRAINAGE.--Record to near-record low stages were reached at several points in the Atlantic Slope drainage during August.

The Delaware River at Trenton, N. J., reached a new record low stage of -0.5 foot on the 26th and 27th. The previous record low stage was -0.4 foot on September 7-8, 1944, which was equaled in July 1954.

The minimum daily flow of the Rappahannock River near Fredericksburg, Va., 53 c.f.s. was the lowest since the drought of 1930-31.

The Lynches River at Effingham, S. C., equaled the all-time low of 1.4 feet established August 26, 1899. The Pee Dee River at Peedee, S. C., reached a new record low stage of 1.0 foot on the 24th; the previous low was 1.5 feet on October 9-10, 1951.

The Altamaha River reached a new record low stage of -2.6 feet at Doctortown, Ga. The previous record low stage was -2.3 feet on September 22, 1941.

EAST GULF OF MEXICO DRAINAGE.--Streams remained at low stages throughout the month. The Cahaba River reached a record low stage of 0.95 foot at Marion Junction, Ala., on the 31st. The previous lowest stage of record at this point was 1.04 feet on October 7, 1935. Near-record low stages were reached at several other points. This was the eighth consecutive month that precipitation averaged below normal.

Upper Mississippi Basin.--The recurrent heavy showers (7 to 10 inches for the period) over central Iowa from the 21st through the 27th caused streams in central Iowa to rise rapidly to above bankfull stage. Losses were light from this flood, since vulnerable croplands had already been lost by the floods of late June and early July. Rivers did not get high enough to cause trouble in urban areas, although minor damage was reported from local flooding during heavy showers.

Missouri Basin.--Heavy thundershowers during the afternoon of the 6th caused rapid runoff in Marcy Gulch (tributary of the South Platte River) a few miles south of Littleton, Colo. The heavy runoff plugged the culvert under State Highway 221, backing water to a depth of 4 feet into Blakeland Underpass (U. S. Highway 85) and holding up traffic for 2 hours. Below State Highway 221 the flood waters washed out the road section and concrete chute spillway to a private stock pond and destroyed the west end of the wooden flume of the Denver Water Department located 1,000 feet below the highway.

A rainstorm of cloudburst proportions during the afternoon of the 7th caused flooding on West Cherry Creek for a distance of 15 miles. This storm was centered east of Palmer Lake, Colo., and most of the rain occurred in a period of 20 minutes. Three bridges were totally destroyed and 4 others had approaches washed out. Miles of county roads were eroded due to cross drainage.

Heavy rains over Plum Creek near Castle Rock, Colo., on the 12th caused heavy runoff on an adjacent gulch, washing out a county bridge and eroding the gulch itself. Some railroad and highway damage was reported.

Heavy rain occurred again over Plum Creek, west of Castle Rock, Colo., during the night of the 20th and 21st. Four inches of rainfall was reported between 9 p.m. and midnight. The main flood came down West Plum Creek with the greatest damage occurring downstream from Sedalia, Colo., on the main stem of Plum Creek. Seven bridges were damaged and three bridges were completely destroyed.

Light flooding occurred in the Nemaha River at Falls City, Nebr., on the 8th.

Moderate to locally severe flooding occurred in the upper Big Blue River during the early part and again during the latter part of the month. Notably high stages were recorded at Barnston, Nebr., and Marysville, Kans. The crest of 28.3 feet at Barnston on the 8th was exceeded only in 1941 and 1947. The crest of 40.4 feet at Marysville on the 8th-9th was the fourth highest stage of record. Flood stages were reported downstream on the Big Blue to near Randolph, Kans. A slight overflow was reported on Red Willow Creek at Red Willow, Nebr., and on Frenchman Creek at Wauneta, Nebr., on the night of the 16th-17th, as a result of 4½ inches of rain. The first flood on the Big Blue River was due to the accumulative effects of rainfall on the 1st-2d and 5th to 8th. The second overflow was initiated by daily scattered light to occasionally moderate showers beginning on the 18th-19th and terminating in 1- to 2-inch rains on the 23d-24th. Damages were light to moderate, mostly to bridges and fences in Nebraska with the major loss in Kansas being to corn fields.

Ohio Basin.--A flash flood occurred on Buffalo Creek at Farmington, W. Va., on the 21st. Property damage was estimated at several thousand dollars. A few families were forced to evacuate from their homes.

Heavy rain during the evening of the 8th caused streams to overflow in the Sequatchie Valley in Tennessee. The storm was centered near Dunlap, Tenn., and was the worst that any of the residents could remember. The precipitation averaged 4.8 inches over a 2,100-square mile area and 7 inches over the 390 square miles in the center. Flood damages were estimated at about $50,000.

Arkansas Basin.--Streams in the Arkansas Basin continued low, except for a minor rise in the Arkansas River between the 7th and 11th. It was the first time since 1900 that the North Canadian River stopped flowing at Wetumka, Okla. Record low stages were reached on the Arkansas River at Tulsa, Okla., (2.3 feet) and Wichita, Kans.; and on the Cimarron River at Perkins, Okla. (2.4 feet) during August.

WEST GULF OF MEXICO DRAINAGE.--Streams in the Sabine Basin remained low throughout the month. The Lake Fork River at Quitman, Tex., went dry during the month.

There were a number of excessively heavy thunderstorms over the tributaries of the Rio Grande above Albuquerque, N. Mex., on the 10th that caused a rise in the main stem to a stage of 5.9 feet at Albuquerque, on the 11th (0.1 foot below flood stage).

Great Salt Lake Basin.--A flash flood occurred in Goulds Wash at Hurricane, Utah, on the 4th, doing damage to canals and small bridges and to some crops such as melons, vegetables, and corn. A few basements were flooded.

GULF OF CALIFORNIA DRAINAGE.--Considerable flash flooding occurred in and near mountains in central and southeastern Arizona due to heavy thundershowers on the 4th-5th and the 19th-20th. Heaviest damage occurred in the Continental-Sahuarita area on the Santa Cruz River on the 4th-5th, the lower Queen Creek drainage basin at Gilbert and Higley, Ariz., on the 19th-20th, and Miami, Ariz., on the 20th. The heaviest concentration of precipitation, on the 19th, occurred in Queen Creek, a tributary of the Gila River. The precipitation averaged 2 to 4.5 inches over the mountains and foothills of upper Queen Creek drainage area. Approximately 17,000 acres of farmland from Williams Air Force Base on the north to Chandler Heights Irrigation District on the south, and from the Maricopa-Pinal County line on the east to the Roosevelt Water Conservation District Canal on the west. Runoff from the Superstition Mountain area flooded irrigated agricultural land adjacent to the Roosevelt Water Conservation District dike and canal. Water overtopped and broke through the dike in several places, flooding farmland from the dike to Gilbert, Ariz., on the west. This latter overflow involved approximately 13,000 acres extending from Williams Air Force Base and the Southern Pacific Railroad on the south to the vicinity of Gila and Salt River Base line on the north. Major damage occurred to crops and irrigation facilities.

FLOOD STAGE DATA

Table 5

(All dates in August unless otherwise specified)

AUGUST 1954

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
	Ft			Ft	
MISSISSIPPI SYSTEM Upper Mississippi Basin					
Iowa: Marshalltown, Iowa	13	27	29	16.1	28
Raccoon:					
Jefferson, Iowa	10	30	**	14.2	29
Van Meter, Iowa	13	30	**	14.1	31
Des Moines:					
Tracy, Iowa	14	27	**	14.8	Sept. 1
Eddyville, Iowa	15	27	28	15.9	27
		30	**	16.3	Sept. 1
Ottumwa, Iowa	9	31	**	9.7	31

* Provisional
** Continued at end of month
# Highest stage reported but not necessarily the crest

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
	Ft			Ft	
MISSISSIPPI SYSTEM (Cont'd.) Missouri Basin					
Nishnabotna: Hamburg, Iowa	18	22	25	22.03	23
Nemaha: Falls City, Nebr.	20	8	8	24.31	8
Red Willow Creek:					
Red Willow, Nebr.	12	17	17	12.4	17
Big Blue:					
Beatrice, Nebr.	16	7	8	19.6	7
				22.4	8
		24	24	20.0	24
Barnston, Nebr.	18	7	9	28.3	8
		23	25	27.8	24
Marysville, Kans.	35	7	9	40.4	8
		24	25	39.3	25
Blue Rapids, Kans.	20	7	10	26.6	9
		24	24	25.4	24
		25	26	26.1	25
Garrison, Kans.	17	9	10	#18.35	10
		25	26	#17.4	25

RADIOSONDE DATA

Average monthly values

Table 20

AUGUST 1954

Standard pressure surface (mb.)	ALBUQUERQUE, N. MEX. (840 MB.)				ATLANTA, GA. (983 MB.)				BISMARCK, N. DAK. (955 MB.)				BOISE, IDAHO (912 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,619	24.3	42	31	309	26.3	68	31	505	19.7	73	31	868	22.6	38
1000	31	48			31	154			31	105			31	59		
950	31	518			31	612	26.9	55	31	555	20.5	66	31	517		
900	31	1,006			31	1,088	24.0	66	31	1,020	19.6	55	31	987	24.3	77
850	31	1,509			31	1,585	20.1	59	31	1,509	16.4	57	31	1,484	21.5	26
800	31	2,041	22.2	88	31	2,105	16.2	66	31	2,023	13.5	55	31	2,004	17.0	99
750	31	2,602	18.0	41	31	2,655	12.4	61	31	2,568	10.2	52	31	2,555	12.4	34
700	31	3,184	13.2	77	31	3,227	8.7	77	31	3,134	6.2	55	31	3,124	7.5	99
650	31	3,805	8.1	56	31	3,844	5.1	56	31	3,741	2.0	51	31	3,731	2.7	44
600	31	4,458	2.7	66	31	4,487	1.4	55	31	4,377	- 2.3	77	31	4,371	- 2.4	66
550	31	5,156	- 2.4	66	31	5,187	- 2.3	46	31	5,064	- 6.5	41	31	5,057	- 7.5	45
500	31	5,907	- 7.2	66	31	5,934	- 6.7	44	31	5,801	-11.5	77	31	5,791	-12.7	88
450	31	6,732	-12.0	51	30	6,759	-12.1	34	31	6,608	-17.2	38	31	6,595	-18.6	33
400	31	7,615	-17.6	55	29	7,638	-18.1	33	31	7,473	-23.5	99	31	7,454	-24.8	
350	31	8,600	-24.2	38	29	8,621	-25.1		31	8,435	-30.7	39	31	8,411	-32.0	
300	31	9,705	-32.5	55	29	9,720	-33.8		30	9,510	-39.0		31	9,481	-40.0	
250	31	10,962	-42.3		28	10,972	-43.4		30	10,735	-48.1		31	10,703	-47.9	
200	31	12,433	-53.5		28	12,435	-54.7		30	12,179	-54.7		31	12,159	-52.0	
175	31	13,280	-59.4		28	13,278	-60.1		30	13,031	-55.4		30	13,025	-53.8	
150	29	14,231	-65.3		28	14,226	-65.2		30	14,009	-56.7		29	14,016	-54.5	
125	28	15,330	-69.2		27	15,326	-68.7		30	15,159	-58.8		27	15,182	-56.4	
100	24	16,658	-69.2		26	16,660	-67.4		29	16,556	-59.4		26	16,589	-57.6	
80	21	18,005	-63.8		25	18,016	-63.7		29	17,956	-57.8		22	17,999	-56.9	
60	20	19,792	-58.1		24	19,799	-59.5		28	19,781	-55.0		21	19,833	-53.5	
50	20	20,946	-56.0		23	20,945	-57.6		27	20,950	-53.5		19	21,010	-52.8	
40	18	22,367	-53.7		21	22,358	-55.3		25	22,388	-51.8		15	22,454	-50.9	
30	12	24,219	-51.7		17	24,214	-51.7		22	24,267	-49.0		9	24,319	-49.2	
20					5	26,873	-48.1		11	26,928	-47.0					
15									5	28,823	-46.3					

Standard pressure surface (mb.)	BROWNSVILLE, TEX. (1013 MB.)				BUFFALO, N. Y. (993 MB.)				BURRWOOD, LA. (1016 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	7	27.7	81	30	221	18.1	82	31	3	28.0	79
1000	31	126	27.0	99	30	122			31	146	27.3	77
950	31	583	24.5	74	30	566	18.5	65	31	603	24.7	68
900	31	1,053	22.5	66	30	1,026	15.2	77	31	1,073	22.0	66
850	31	1,549	20.2	52	30	1,508	11.9	71	31	1,567	19.2	59
800	31	2,070	17.4	99	30	2,013	9.1	77	31	2,087	16.1	55
750	31	2,623	14.3	45	30	2,551	6.3	59	31	2,635	12.9	48
700	31	3,197	10.7	44	30	3,109	3.4	55	31	3,209	9.5	44
650	31	3,816	6.9	40	29	3,712	.4	47	31	3,821	5.9	42
600	31	4,465	3.0	44	29	4,346	- 3.1	44	31	4,471	2.1	44
550	31	5,169	- 1.2	39	29	5,032	- 6.9		31	5,174	- 2.0	42
500	31	5,919	- 5.8	88	29	5,768	-11.5		31	5,920	- 6.6	77
450	31	6,749	-11.1	34	29	6,577	-16.7		31	6,749	-12.0	38
400	31	7,631	-17.2	55	29	7,444	-22.8		31	7,626	-18.1	44
350	31	8,618	-24.4		29	8,409	-29.9		31	8,609	-25.3	
300	31	9,722	-32.8		29	9,488	-38.0		31	9,709	-33.7	
250	31	10,979	-42.8		29	10,719	-46.7		31	10,961	-43.3	
200	31	12,448	-54.3		29	12,174	-54.0		31	12,426	-54.2	
175	31	13,292	-60.1		29	13,025	-56.5		31	13,269	-59.9	
150	31	14,240	-65.8		26	13,985	-58.6		31	14,220	-64.8	
125	29	15,335	-70.3		18	15,114	-59.8		29	15,318	-69.2	
100	28	16,655	-71.7		8	16,523	-60.8		29	16,644	-69.7	
80	24	17,978	-68.5						28	17,981	-66.8	
60	20	19,732	-62.1						23	19,742	-61.7	
50	19	20,868	-58.7						21	20,877	-59.4	
40	17	22,274	-56.0						11	22,286	-56.5	
30	13	24,116	-52.7									
20												
15												

Standard pressure surface (mb.)	CARIBOU, ME. (989 MB.)				CHARLESTON, S. C. (1015 MB.)				COLUMBIA, MO. (987 MB.)				DODGE CITY, KANS. (923 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	191	13.9	86	31	13	25.2	86	31	238	25.4	70	31	792	27.1	50
1000	31	94			31	145	26.5	99	31	117			31	72		
950	31	531	15.4	65	31	605	25.0	67	31	578	26.3	59	31	535		
900	31	987	12.6	66	31	1,073	22.4	66	31	1,048	23.6	88	31	1,015	27.6	44
850	31	1,464	9.2	66	31	1,568	18.9	67	31	1,545	20.4	62	31	1,519	24.5	45
800	31	1,964	5.7	99	31	2,086	15.4	66	31	2,067	17.0	66	31	2,048	20.7	99
750	31	2,494	2.6	64	31	2,638	12.2	58	31	2,619	13.1	62	31	2,606	16.3	53
700	31	3,044	- .4	88	31	3,206	8.8	99	31	3,191	9.0	66	31	3,185	11.8	55
650	31	3,638	- 3.2	48	31	3,821	5.2	58	31	3,808	5.1	58	31	3,804	7.1	54
600	31	4,263	- 6.7	44	31	4,465	1.6	55	31	4,451	1.2	55	30	4,455	2.6	55
550	31	4,940	-10.1	36	31	5,164	- 2.4	45	31	5,151	- 3.0	50	30	5,156	- 1.8	43
500	31	5,667	-14.6	33	31	5,911	- 6.8	88	31	5,895	- 7.6	44	30	5,905	- 6.6	44
450	31	6,467	-20.1	35	31	6,740	-11.6	35	31	6,719	-12.8	33	30	6,732	-11.9	34
400	31	7,319	-26.1	77	31	7,620	-17.4	44	31	7,596	-19.0		30	7,612	-17.8	55
350	31	8,271	-33.2		31	8,605	-24.6		30	8,574	-26.5		30	8,597	-24.6	
300	31	9,335	-41.0		31	9,707	-33.1		30	9,669	-34.7		30	9,700	-32.8	
250	31	10,551	-48.8		30	10,961	-43.2		30	10,916	-44.2		29	10,955	-42.6	
200	31	12,002	-51.5		30	12,426	-54.4		30	12,377	-54.8		28	12,424	-53.7	
175	31	12,868	-51.9		30	13,269	-60.2		29	13,222	-60.0		27	13,269	-59.2	
150	31	13,863	-53.0		30	14,217	-65.2		29	14,173	-64.3		27	14,221	-64.4	
125	31	15,035	-54.0		29	15,319	-68.7		29	15,278	-67.2		25	15,322	-68.1	
100	31	16,465	-54.0		28	16,653	-68.3		26	16,619	-66.3		23	16,659	-68.1	
80	31	17,899	-53.1		27	18,003	-64.4		22	17,979	-63.1		19	18,007	-63.5	
60	27	19,758	-51.4		23	19,783	-59.5		20	19,770	-58.7		16	19,795	-58.3	
50	26	20,944	-50.7		21	20,927	-57.8		20	20,923	-55.2		16	20,945	-56.2	
40	24	22,399	-49.7		21	22,340	-55.6		20	22,351	-53.9		14	22,367	-53.7	
30	23	24,281	-48.6		16	24,184	-53.0		19	24,214	-50.6		10	24,232	-51.3	
20	12	26,968	-46.8						12	26,854	-46.9					

Standard pressure surface (mb.)	EL PASO, TEX. (882 MB.)				ELY, NEV. (809 MB.)				GLASGOW, MONT. (938 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,195	27.6	45	31	1,908	20.5	25	31	648	20.3	61
1000	31	59			31	26			31	86		
950	31	528			31	495			31	538		
900	31	1,012			31	978			31	1,004	19.9	55
850	31	1,517	25.6	44	31	1,475			31	1,494	16.8	51
800	31	2,047	21.3	88	31	2,004	22.6	99	31	2,007	13.2	55
750	31	2,605	16.6	55	31	2,564	18.5	20	31	2,555	9.4	51
700	31	3,186	11.8	66	31	3,146	13.1	44	30	3,116	5.4	55
650	31	3,805	6.8	65	31	3,764	7.3	30	30	3,722	1.1	51
600	31	4,455	2.0	66	31	4,414	1.2	88	29	4,357	- 3.4	55
550	31	5,153	- 2.5	59	31	5,108	- 4.9	45	29	5,041	- 8.2	47
500	31	5,902	- 7.0	66	31	5,849	-10.8	66	29	5,773	-13.3	55
450	31	6,729	-11.8	52	31	6,663	-15.8	34	29	6,575	-18.5	42
400	31	7,610	-17.6	44	31	7,531	-21.7		29	7,436	-24.6	44
350	30	8,597	-24.2	35	31	8,501	-28.9		29	8,392	-32.1	39
300	30	9,701	-32.8		31	9,586	-37.0		29	9,460	-40.7	
250	29	10,956	-42.9		31	10,822	-46.0		29	10,674	-50.0	
200	29	12,421	-54.9		31	12,280	-53.9		28	12,102	-55.5	
175	29	13,262	-60.9		30	13,128	-56.9		28	12,955	-54.2	
150	28	14,204	-67.1		30	14,098	-59.8		28	13,943	-54.4	
125	28	15,289	-71.5		30	15,230	-62.1		28	15,105	-56.3	
100	25	16,608	-70.4		29	16,608	-62.7		26	16,515	-57.3	
80	22	17,949	-65.2		28	17,985	-60.5		25	17,930	-55.8	
60	20	19,730	-58.6		25	19,795	-56.3		23	19,768	-53.8	
50	20	20,879	-57.1		25	20,957	-55.0		21	20,937	-52.8	
40	19	22,296	-54.4		24	22,392	-52.6		16	22,380	-51.4	
30	9	24,154	-51.2		21	24,248	-50.7		10	24,246	-49.6	
20												

Standard pressure surface (mb.)	GRAND JUNCTION, COLO. (852 MB.)				GREAT FALLS, MONT. (887 MB.)				GREEN BAY, WIS. (992 MB.)				GREENSBORO, N. C. (986 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,474	25.0	28	31	1,122	19.1	53	31	210	17.4	82	30	273	22.4	83
1000	31	34			31	74			31	133			30	146		
950	31	506			31	534			31	578	18.5	64	30	600	24.4	61
900	31	991			31	1,004			31	1,038	15.8	66	30	1,068	21.7	66
850	31	1,490	25.4	28	31	1,489	18.0	44	31	1,521	12.7	62	30	1,562	18.3	64
800	31	2,022	23.9	44	31	2,005	14.4	99	31	2,027	9.8	66	30	2,079	14.6	77
750	31	2,586	19.2	27	31	2,554	10.3	54	31	2,568	7.3	51	30	2,629	11.2	65
700	31	3,168	13.9	33	31	3,117	5.8	66	31	3,126	4.3	88	30	3,195	7.9	99
650	31	3,790	8.2	39	31	3,724	1.1	65	31	3,728	1.1	41	30	3,812	4.5	53
600	31	4,441	2.5	77	31	4,358	- 3.7	77	31	4,366	- 2.4	77	30	4,452	1.0	88
550	31	5,137	- 3.1	53	31	5,044	- 8.4	63	31	5,053	- 6.6	35	30	5,154	- 2.8	42
500	31	5,886	- 8.3	44	31	5,772	-13.6	99	31	5,790	-10.9	33	30	5,897	- 7.0	44
450	31	6,705	-13.9	37	31	6,575	-19.4	54	31	6,599	-16.3		30	6,726	-12.2	43
400	31	7,579	-20.0		31	7,430	-25.7	99	31	7,468	-22.4		30	7,603	-18.2	44
350	30	8,552	-27.2		31	8,382	-33.1	47	31	8,435	-29.3		30	8,586	-24.9	34
300	30	9,643	-35.4		31	9,446	-41.3		31	9,516	-37.6		30	9,687	-33.2	44
250	30	10,886	-44.3		31	10,658	-50.3		31	10,749	-46.4		30	10,942	-42.6	
200	30	12,351	-53.5		31	12,094	-55.3		31	12,206	-52.9		30	12,413	-53.4	
175	30	13,200	-58.0		31	12,946	-54.4		30	13,058	-55.8		30	13,261	-58.9	
150	30	14,160	-62.1		31	13,934	-54.4		30	14,033	-58.3		28	14,217	-63.3	
125	30	15,277	-65.4		31	15,097	-56.3		28	15,172	-60.1		28	15,328	-66.1	
100	25	16,625	-65.4		31	16,508	-57.7		28	16,562	-60.1		28	16,681	-65.3	
80	23	17,993	-61.0		31	17,919	-56.3		27	17,955	-58.3		25	18,048	-62.5	
60	21	19,799	-56.3		29	19,751	-54.5		26	19,777	-55.0		21	19,845	-57.2	
50	20	20,959	-54.6		27	20,918	-53.4		26	20,947	-52.9		21	21,003	-55.1	
40	20	22,395	-52.2		27	22,358	-51.7		26	22,393	-51.0		21	22,433	-53.3	
30	11	24,262	-50.2		22	24,238	-48.9		19	24,287	-49.0		17	24,300	-50.5	
20					9	26,914	-45.7		5	26,937	-47.3		6	26,929	-47.8	
15																

Standard pressure surface (mb.)	HATTERAS, N. C. (1015 MB.)				HILO, T. H. (1014 MB.)				INTERNAT. FALLS, MINN. (973 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	3	25.9	80	30	9	26.1	77	31	360	15.6	80
1000	31	132	25.5	77	30	130	23.1	77	31	124		
950	31	585	23.3	70	30	579	19.9	79	31	563	17.3	70
900	31	1,054	20.5	66	30	1,041	16.7	88	31	1,023	14.3	99
850	31	1,547	17.4	64	30	1,526	13.6	86	31	1,503	11.0	70
800	31	2,062	14.5	55	30	2,036	12.1	77	31	2,006	8.4	66
750	31	2,610	11.4	53	30	2,587	10.9	47	31	2,543	5.6	58
700	31	3,179	8.1	55	30	3,151	8.5	44	30	3,101	2.5	55
650	31	3,792	4.7	47	30	3,766	5.3	33	30	3,698	- .5	48
600	31	4,435	1.0	44	29	4,411	2.0		30	4,333	- 4.0	44
550	31	5,134	- 3.0	44	29	5,108	- 1.8		29	5,013	- 8.1	38
500	31	5,878	- 7.1	44	29	5,860	- 6.4		29	5,747	-12.8	
450	31	6,705	-12.1	39	29	6,690	-11.7		29	6,547	-18.3	
400	31	7,583	-17.9	66	29	7,568	-17.7		29	7,410	-24.5	
350	31	8,567	-25.2	37	29	8,552	-25.2		29	8,368	-31.9	
300	31	9,668	-33.5	77	29	9,650	-34.2		29	9,437	-40.1	
250	29	10,920	-43.3		29	10,897	-44.5		29	10,656	-48.8	
200	29	12,386	-54.1		29	12,351	-56.5		29	12,103	-53.2	
175	29	13,232	-59.5		28	13,185	-63.0		29	12,961	-53.7	
150	28	14,183	-64.9		28	14,118	-69.2		29	13,948	-55.1	
125	28	15,285	-67.9		28	15,194	-72.5		29	15,108	-56.4	
100	25	16,624	-66.7		20	16,500	-72.6		28	16,520	-57.2	
80	25	17,983	-62.7		27	17,819	-69.4		28	17,930	-56.7	
60	24	19,780	-57.8		26	19,559	-64.2		24	19,767	-54.3	
50	22	20,931	-56.5		22	20,682	-60.7		24	20,939	-52.9	
40	19	22,358	-54.3		21	22,073	-59.2		23	22,385	-51.2	
30	11	24,216	-51.9		11	23,875	-56.8		21	24,262	-49.1	
20									10	26,927	-46.4	
15									5	28,824	-45.4	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Standard pressure surface (mb.)	LAKE CHARLES, LA. (1016 MB.)				LANDER, WYO. (829 MB.)				LAS VEGAS, NEV. (933 MB.)				LITTLE ROCK, ARK. (1005 MB.)				MAZATLAN, MEXICO (1010 MB.)				MEDFORD, ORE. (967 MB.)				MIAMI, FLA. (1016 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	5	26.1	83	29	1,696	22.0	27	31	660	32.7	14	31	79	29.3	57	12	14	29.1		31	401	22.3	46	31	4	27.9	76
1000	31	142	26.7	77	29	31			31	27			31	123	29.8	55	12	102	28.2		31	110			31	147	27.2	77
950	31	597	25.0	68	29	497			31	499			31	590	29.6	48	12	568	25.1		31	562	21.4	45	31	601	24.3	73
900	31	1,069	22.6	66	29	978			31	983	32.1		31	1,063	26.2	55	12	1,032	22.6		31	1,022	17.8	55	31	1,073	21.3	77
850	31	1,564	19.7	56	29	1,479			31	1,492	27.5	17	31	1,565	22.1	57	12	1,528	19.6		31	1,508	14.0	57	31	1,566	18.3	68
800	31	2,084	16.8	55	29	2,008	22.4	22	31	2,023	22.6	99	31	2,089	17.9	66	12	2,049	17.0		31	2,016	10.2	66	31	2,084	15.3	66
750	31	2,634	13.5	51	29	2,564	17.3	23	31	2,585	17.4	24	31	2,644	14.0	57	12	2,603	13.9		31	2,558	7.0	57	31	2,630	12.1	58
700	31	3,209	10.0	55	29	3,146	12.0	77	31	3,162	12.0	99	31	3,216	10.2	55	12	3,177	10.6		31	3,115	3.8	66	31	3,203	8.8	66
650	30	3,819	6.2	44	29	3,761	6.4	34	31	3,782	6.7	35	31	3,837	6.4	51	11	3,795	6.4		31	3,715	.2	38	31	3,814	5.1	56
600	30	4,472	2.3	44	29	4,409	.7	99	31	4,429	2.3		31	4,482	2.5	99	10	4,448	2.4		31	4,349	-3.9	33	31	4,461	1.3	55
550	30	5,173	-1.8	41	29	5,096	-5.0	42	31	5,126	-2.5		30	5,188	-1.2	38	9	5,158	-1.7		31	5,030	-8.5	32	31	5,160	-2.9	50
500	30	5,922	-6.3	77	29	5,840	-10.9	44	30	5,875	-7.6		30	5,934	-5.8	66	8	5,900	-6.3		31	5,762	-13.5	66	31	5,905	-7.1	44
450	29	6,749	-11.6	33	29	6,647	-16.8	35	29	6,697	-13.4		30	6,766	-11.1	33	8	6,730	-11.3		31	6,563	-19.2	35	30	6,732	-12.1	38
400	28	7,631	-17.5		29	7,514	-23.3		29	7,573	-19.7		30	7,647	-16.9		6	7,612	-16.2		31	7,420	-25.3	77	30	7,610	-18.0	44
350	26	8,615	-24.8		28	8,477	-30.4		29	8,549	-27.5		30	8,634	-24.1		6	8,602	-23.5		31	8,375	-32.6		30	8,594	-24.8	38
300	24	9,715	-33.1		27	9,553	-39.0		28	9,638	-36.0		30	9,740	-32.6						31	9,443	-40.8		30	9,697	-33.1	77
250	24	10,969	-43.0		26	10,774	-47.9		28	10,878	-45.4		28	11,000	-42.2						30	10,666	-48.4		30	10,952	-43.0	
200	23	12,431	-54.7		26	12,220	-54.6		28	12,334	-54.7		28	12,473	-53.4						30	12,119	-52.4		29	12,419	-54.5	
175	18	13,270	-60.8		25	13,073	-56.1		28	13,179	-59.0		28	13,320	-59.0						30	12,980	-53.1		28	13,264	-60.3	
150	16	14,220	-65.9		25	14,045	-58.9		26	14,137	-62.9		27	14,272	-64.7						30	13,971	-54.2		27	14,214	-66.0	
125	15	15,317	-69.5		24	15,179	-61.7		21	15,256	-65.9		27	15,372	-68.8						28	15,139	-55.7		23	15,305	-70.6	
100	11	16,645	-69.8		24	16,557	-62.0		8	16,590	-67.2		26	16,705	-68.5						24	16,555	-57.1		21	16,625	-70.6	
80	10	17,983	-67.4		23	17,938	-59.3						24	18,051	-64.8						20	17,963	-56.9		21	17,959	-66.7	
60	9	19,735	-62.3		21	19,760	-55.7						21	19,827	-58.8						17	19,792	-54.3		21	19,719	-61.5	
50	8	20,870	-58.5		21	20,925	-54.2						21	20,978	-56.3						16	20,967	-53.1		21	20,854	-59.1	
40	7	22,283	-55.8		15	22,345	-52.5						18	22,404	-53.6						15	22,410	-51.6		18	22,262	-56.7	
30					10	24,212	-50.2						13	24,250	-50.9						11	24,284	-49.5		12	24,090	-53.6	
20					5	26,842	-48.0																		7	26,705	-50.4	

Standard pressure surface (mb.)	MIDLAND, TEX. (916 MB.)				NANTUCKET, MASS. (1013 MB.)				NASHVILLE, TENN. (996 MB.)				NORTH PLATTE, NEBR. (916 MB.)				OAKLAND, CALIF. (1014 MB.)				OKLAHOMA CITY, OKLA. (969 MB.)				OMAHA, NEBR. (979 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	871	28.0	49	31	14	18.0	90	31	177	26.8	67	31	848	22.4	76	31	6	15.5	78	31	391	28.7	52	31	300	24.2	78
1000	31	78			31	121	19.1	88	31	140			31	75			31	127	14.2	99	31	104			31	116		
950	31	542			31	565	18.6	65	31	600	26.6	53	31	534			31	571	15.5	67	31	568	29.7	44	31	570	23.6	72
900	31	1,025	27.8	66	31	1,026	15.6	77	31	1,071	23.4	66	31	1,004	23.8	66	31	1,023	17.8	99	31	1,047	27.3	44	31	1,038	21.6	88
850	31	1,530	24.3	50	31	1,509	13.0	61	31	1,568	19.7	61	31	1,504	21.8	57	31	1,510	16.3	30	31	1,549	23.4	48	31	1,533	19.5	61
800	31	2,058	20.2	77	31	2,016	10.3	55	31	2,087	16.0	66	31	2,028	18.8	55	31	2,023	13.8		31	2,075	19.4	55	31	2,053	16.8	66
750	31	2,613	15.9	62	31	2,557	7.4	56	31	2,638	12.3	61	31	2,584	15.2	51	31	2,572	11.0		31	2,626	15.2	54	31	2,605	13.3	55
700	31	3,195	11.9	66	31	3,116	4.3	55	31	3,208	8.9	66	31	3,160	10.9	77	30	3,134	7.7		31	3,207	11.2	55	31	3,177	9.3	88
650	31	3,814	7.6	59	31	3,718	1.1	46	31	3,825	5.0	56	31	3,777	6.6	42	30	3,741	4.1		30	3,822	7.1	45	31	3,793	5.0	58
600	31	4,467	3.4	55	31	4,356	-2.4	88	31	4,467	1.0	55	31	4,426	1.7	44	30	4,386	-.2		30	4,474	2.8	44	31	4,437	.7	55
550	31	5,174	-1.0	51	31	5,045	-5.8	32	31	5,166	-2.7	47	31	5,121	-3.3	41	30	5,077	-4.8		30	5,176	-1.6	38	31	5,135	-3.7	50
500	31	5,923	-5.3	55	31	5,783	-10.4	33	31	5,912	-6.8	44	31	5,868	-8.5	44	30	5,818	-10.3		30	5,926	-5.7	55	31	5,870	-8.1	44
450	30	6,762	-10.4	33	31	6,593	-15.8	36	31	6,738	-11.8	35	30	6,686	-13.9	41	30	6,629	-16.2		30	6,759	-10.8	29	30	6,700	-13.2	39
400	30	7,641	-16.3	33	31	7,465	-21.4		31	7,619	-17.7	33	29	7,566	-19.8		30	7,496	-22.7		30	7,638	-17.1		30	7,575	-19.4	44
350	29	8,631	-23.3	33	31	8,436	-28.4	37	31	8,605	-24.8		29	8,542	-27.0		30	8,460	-30.2		30	8,625	-24.1		30	8,554	-26.1	
300	28	9,740	-31.7		31	9,522	-36.3		30	9,709	-32.9		28	9,636	-35.1		30	9,539	-38.2		30	9,730	-32.4		30	9,650	-34.3	
250	28	11,001	-41.6		31	10,763	-44.8		30	10,965	-42.6		26	10,881	-44.6		29	10,773	-46.9		29	10,987	-42.4		27	10,904	-43.7	
200	27	12,475	-52.8		31	12,225	-53.2		29	12,436	-53.5		25	12,344	-54.3		29	12,225	-54.0		29	12,457	-53.5		27	12,371	-53.8	
175	26	13,325	-58.3		31	13,079	-56.2		29	13,284	-59.0		24	13,189	-59.1		28	13,076	-55.8		29	13,305	-59.1		26	13,219	-58.9	
150	26	14,282	-63.8		31	14,050	-58.8		29	14,238	-64.2		24	14,145	-63.3		28	14,050	-57.8		29	14,257	-64.6		26	14,175	-63.1	
125	21	15,388	-68.7		31	15,189	-60.7		29	15,345	-66.8		24	15,256	-66.4		27	15,194	-60.0		28	15,359	-68.3		24	15,285	-65.3	
100	20	16,715	-69.7		30	16,576	-60.2		27	16,691	-66.5		20	16,605	-66.8		27	16,577	-61.9		24	16,688	-69.0		23	16,637	-65.4	
80	19	18,057	-65.0		27	17,975	-57.7		26	18,051	-63.6		18	17,971	-62.0		27	17,961	-60.3		21	18,034	-64.0		21	18,009	-62.1	
60	19	19,838	-58.5		23	19,802	-54.3		22	19,838	-57.4		18	19,765	-58.3		26	19,769	-56.8		18	19,818	-58.3		20	19,803	-57.7	
50	17	20,989	-56.3		21	20,975	-52.8		22	20,994	-55.5		17	20,918	-56.1		22	20,925	-54.9		17	20,973	-56.0		16	20,963	-55.6	
40	14	22,407	-54.7		20	22,420	-51.4		21	22,422	-53.5		13	22,336	-53.6		17	22,357	-53.1		15	22,403	-53.9		13	22,388	-52.4	
30	11	24,257	-51.9		19	24,294	-49.6		17	24,288	-50.5		9	24,188	-51.1		12	24,219	-50.7		13	24,260	-51.0		10	24,245	-50.3	
20	5	26,884	-48.6																									

Standard pressure surface (mb.)	PHOENIX, ARIZ. (970 MB.)				PITTSBURGH, PA. (976 MB.)				PORTLAND, ME. (1011 MB.)				RAPID CITY, S. DAK. (904 MB.)				ST. CLOUD, MINN. (978 MB.)				SAN ANTONIO, TEX. (986 MB.)				SAN JUAN, P. R. (1014 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	341	34.1	36	31	375	20.0	77	31	20	16.0	85	31	966	21.9	55	31	316	18.5	80	31	243	29.9	53	31	19	26.8	83
1000	31	66			31	137			31	111	17.7	77	31	72			31	124			31	119			31	143	26.0	88
950	31	533	33.2	34	31	584	19.7	72	31	554	17.0	62	31	531			31	575	20.0	67	31	582	27.6	58	31	597	22.9	82
900	31	1,018	29.4	66	31	1,047	17.2	77	31	1,009	13.8	66	31	1,004	22.4	55	31	1,033	16.7	88	31	1,055	24.2	66	31	1,065	19.9	88
850	31	1,524	25.1	40	31	1,533	14.2	72	31	1,489	10.7	66	31	1,500	21.1	50	31	1,518	13.7	64	31	1,554	21.1	64	31	1,557	17.0	80
800	31	2,052	20.5	77	31	2,043	11.0	99	31	1,991	8.0	66	31	2,022	17.5	55	31	2,027	11.5	55	31	2,077	17.5	66	31	2,073	14.4	77
750	31	2,607	15.7	52	31	2,587	8.4	64	31	2,529	5.5	52	31	2,577	13.5	51	31	2,570	8.5	48	31	2,623	14.3	58	31	2,620	12.1	58
700	31	3,186	10.9	66	31	3,147	5.4	88	31	3,083	2.7	44	31	3,147	9.7	88	31	3,131	5.4	77	31	3,206	11.1	55	31	3,192	9.2	66
650	31	3,808	6.6	53	31	3,754	2.2	53	31	3,682	-.6	43	31	3,763	5.2	45	31	3,739	2.0	40	30	3,816	7.7	44	31	3,807	5.3	46
600	31	4,452	2.0	77	31	4,393	-1.0	66	31	4,315	-4.1	44	31	4,406	-.1	99	31	4,375	-1.8	44	29	4,475	3.8	88	31	4,452	1.7	55
550	31	5,153	-2.5	43	31	5,083	-5.1	45	31	4,997	-8.2	41	31	5,097	-4.9	45	30	5,064	-6.1	36	29	5,179	-.5	37	31	5,153	-2.3	39
500	31	5,900	-6.7		30	5,827	-9.4	44	31	5,730	-13.1	66	31	5,838	-10.0	44	30	5,801	-11.0	55	29	5,932	-5.2	44	31	5,899	-6.6	77
450	31	6,728	-11.9		30	6,643	-14.7	40	30	6,533	-18.0	38	31	6,655	-15.4		30	6,611	-16.7	33	29	6,765	-10.5	37	31	6,727	-11.9	37
400	31	7,606	-17.9		29	7,520	-20.6		30	7,395	-24.2	44	31	7,522	-21.8		30	7,476	-22.9		28	7,648	-16.8	77	31	7,607	-17.4	
350	30	8,589	-25.4		29	8,493	-27.7		30	8,355	-31.1	41	31	8,491	-29.1		30	8,439	-30.2		28	8,637	-23.6		31	8,592	-24.7	
300	30	9,688	-33.6		29	9,581	-35.8		30	9,430	-38.5		31	9,573	-37.4		30	9,517	-38.3		28	9,744	-32.2		31	9,694	-33.3	
250	30	10,942	-43.0		27	10,821	-45.1		30	10,657	-46.8		31	10,806	-46.5		30	10,746	-46.7		27	11,004	-41.9		31	10,947	-43.6	
200	30	12,411	-53.9		27	12,279	-54.6		27	12,104	-52.7		30	12,259	-54.4		30	12,199	-53.7		27	12,478	-53.4		31	12,410	-55.0	
175	30	13,256	-59.6		27	13,124	-58.6		25	12,961	-54.3		29	13,103	-56.7		30	13,051	-56.3		25	13,323	-59.7		31	13,251	-61.1	
150	30	14,206	-65.3		27	14,083	-62.4		25	13,944	-55.8		29	14,073	-59.5		30	14,024	-58.3		24	14,273	-65.4		31	14,193	-66.5	
125	28	15,302	-69.1		26	15,199	-64.5		23	15,104	-57.2		26	15,209	-62.1		30	15,165	-59.8		22	15,369	-69.6		30	15,285	-70.9	
100	27	16,633	-68.8		20	16,556	-63.4		22	16,514	-58.0		25	16,585	-62.2		29	16,554	-60.1		18	16,690	-70.9		28	16,598	-72.8	
80	26	17,983	-64.0		9	17,939	-62.6		22	17,926	-55.6		23	17,970	-59.5		29	17,951	-58.0		17	18,026	-65.8		25	17,915	-69.9	
60	25	19,769	-58.5		5	19,742	-56.9		20	19,767	-53.1		22	19,785	-55.9		29	19,773	-55.3		17	19,795	-60.2		24	19,657	-63.1	
50	23	20,920	-56.2		5	20,897	-55.7		18	20,948	-51.8		22	20,948	-54.5		29	20,940	-53.7		16	20,940	-57.3		24	20,786	-59.9	
40	23	22,343	-54.4						16	22,393	-51.0		22	22,383	-52.4		26	22,382	-51.2		14	22,349	-54.8		22	22,188	-57.4	
30	20	24,188	-51.9						10	24,277	-49.0		19	24,253	-49.9		20	24,260	-49.3		9	24,197	-52.0		19	24,017	-55.1	
20	12	26,830	-48.9										5	26,931	-47.8													
15	6	28,716	-47.4																									

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

AUGUST 1954

Standard pressure surface (mb.)	SANTA MARIA, CALIF. (1006 MB.)				S. STE. MARIE, MICH. (990 MB.)				SPOKANE, WASH. (930 MB.)				SWAN ISLAND, W. I. (1013 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	71	15.1	83	31	221	14.9	87	31	722	20.5	41	31	10	27.3	83
1000	30	126	14.4	88	31	133			31.	90			31	121	26.8	88
950	30	571	15.3	75	31	575	16.0	68	31	539			31	578	23.6	80
900	30	1,023	19.7	77	31	1,029	13.5	66	31	1,007	18.9	44	31	1,045	20.6	77
850	30	1,514	18.5	29	31	1,507	10.3	67	31	1,495	14.9	45	31	1,537	17.7	73
800	30	2,030	15.6	66	31	2,010	7.5	66	31	2,004	10.6	55	31	2,054	14.6	66
750	30	2,579	12.3	29	31	2,549	4.7	62	31	2,543	6.2	56	31	2,602	12.0	55
700	30	3,149	9.0		31	3,099	2.0	88	31	3,100	2.2	66	31	3,173	8.9	77
650	30	3,764	5.6		31	3,699	-1.1	48	31	3,695	-1.6	53	31	3,791	5.3	48
600	30	4,409	1.7		31	4,328	-4.5	44	31	4,328	-5.8	55	31	4,433	1.5	66
550	30	5,106	-2.9		31	5,012	-8.5	37	31	5,003	-10.5	47	31	5,128	-2.5	41
500	30	5,852	-7.9		30	5,739	-13.3	77	31	5,730	-15.7	66	31	5,880	-7.0	99
450	30	6,672	-13.8		30	6,543	-18.7	38	31	6,523	-21.4	47	31	6,705	-11.7	35
400	30	7,547	-20.2		30	7,401	-25.0	66	31	7,374	-27.4	55	31	7,588	-17.3	55
350	29	8,519	-27.8		30	8,358	-32.0		31	8,320	-34.6	42	29	8,575	-24.1	
300	29	9,608	-36.3		30	9,429	-39.7		31	9,378	-42.4		29	9,681	-32.4	
250	29	10,847	-45.5		30	10,653	-47.6		31	10,588	-49.8		28	10,938	-42.3	
200	29	12,306	-53.9		26	12,105	-52.3		30	12,039	-51.0		27	12,407	-54.1	
175	29	13,155	-57.5		22	12,954	-52.6		29	12,907	-50.9		27	13,250	-60.6	
150	29	14,120	-61.2		21	13,950	-54.5		29	13,909	-51.3		25	14,192	-67.1	
125	29	15,242	-64.2		18	15,111	-56.7		27	15,090	-53.3		21	15,277	-71.5	
100	27	16,601	-65.2		10	16,529	-57.2		17	16,533	-55.6		18	16,589	-71.7	
80	26	17,970	-61.9		6	17,961	-55.8		15	17,959	-54.5		17	17,909	-68.8	
60	25	19,766	-58.1						10	19,820	-52.4		16	19,657	-62.7	
50	25	20,920	-55.8						8	20,992	-51.2		16	20,786	-59.1	
40	22	22,345	-53.9						5	22,437	-50.3		12	22,210	-55.7	
30	16	24,198	-51.3										9	24,038	-55.2	
20																

Standard pressure surface (mb.)	TACUBAYA, MEXICO (775 MB.)				TAMPA, FLA. (1016 MB.)				TATOOSH ISLAND, WASH. (1014 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	2,306	16.4	71	30	7	26.0	87	31	31	12.4	95
1000	30	68			30	151	26.4	88	31	145	12.3	99
950	30	532			30	607	24.3	75	31	581	11.5	86
900	30	1,009			30	1,077	21.4	77	31	1,027	10.3	99
850	30	1,504			30	1,570	18.4	69	31	1,501	8.2	75
800	30	2,036			30	2,088	15.3	77	31	2,000	5.8	77
750	30	2,585	14.6	68	30	2,638	12.2	63	31	2,532	3.1	62
700	30	3,162	10.3	77	30	3,208	9.0	77	31	3,083	-.1	77
650	30	3,779	5.6	78	30	3,824	5.5	50	31	3,676	-3.5	54
600	30	4,426	1.1	88	30	4,468	1.7	55	31	4,301	-7.2	88
550	30	5,122	-2.9	76	30	5,171	-2.4	48	31	4,976	-11.6	49
500	30	5,871	-7.4	88	30	5,915	-6.7	44	31	5,697	-16.7	44
450	30	6,695	-12.2	58	30	6,742	-11.8	37	31	6,484	-22.6	39
400	29	7,578	-17.6	55	30	7,623	-17.6	66	31	7,333	-29.1	88
350	25	8,561	-24.4	48	30	8,608	-24.6	36	31	8,273	-36.0	
300	22	9,665	-32.9	44	29	9,710	-32.9	88	31	9,325	-43.8	
250	19	10,922	-43.0		28	10,963	-42.8		31	10,531	-49.6	
200	15	12,382	-55.2		28	12,431	-54.0		31	11,985	-50.3	
175	15	13,222	-61.5		28	13,275	-59.7		31	12,857	-49.9	
150	12	14,161	-67.8		26	14,225	-65.3		31	13,863	-50.6	
125	9	15,242	-72.5		26	15,321	-69.9		31	15,047	-51.9	
100	7	16,545	-73.6		25	16,642	-70.1		31	16,488	-53.0	
80					21	17,982	-66.2		30	17,928	-53.2	
60					19	19,745	-61.8		28	19,782	-52.6	
50					19	20,883	-59.4		27	20,961	-52.4	
40					18	22,281	-56.7		25	22,404	-51.3	
30					16	24,123	-53.7		20	24,280	-49.8	
20					9	26,761	-49.4					

Standard pressure surface (mb.)	VERACRUZ, MEXICO (1011 MB.)				WASHINGTON, D. C. (1006 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	29	13	28.6	77	31	88	21.9	75
1000	29	114	27.8	77	31	137	22.5	77
950	29	567	24.1	77	31	590	21.4	68
900	29	1,040	21.5	88	31	1,051	18.7	77
850	29	1,533	18.4	63	31	1,540	15.8	73
800	29	2,051	15.1	66	31	2,053	12.7	77
750	29	2,600	12.0	59	31	2,600	9.7	65
700	29	3,170	8.8	55	31	3,164	6.7	88
650	29	3,786	5.1	52	31	3,776	3.4	54
600	29	4,429	1.6	77	31	4,416	.2	44
550	28	5,121	-2.1	43	31	5,111	-3.8	40
500	28	5,877	-6.2	99	31	5,854	-8.2	44
450	28	6,704	-11.2	37	31	6,675	-13.4	41
400	28	7,590	-16.8	44	31	7,552	-19.4	77
350	28	8,579	-23.5		31	8,530	-26.5	37
300	28	9,686	-32.1		31	9,624	-34.7	
250	28	10,947	-42.1		31	10,872	-43.8	
200	28	12,417	-54.4		30	12,333	-53.6	
175	28	13,259	-60.9		29	13,178	-58.1	
150	28	14,202	-67.0		29	14,138	-61.7	
125	25	15,289	-71.9		29	15,260	-63.7	
100	20	16,599	-73.3		28	16,624	-63.0	
80	17	17,909	-69.3		26	18,003	-60.3	
60	8	19,634	-64.2		24	19,816	-55.6	
50	8	20,758	-60.5		22	20,979	-54.7	
40	7	22,153	-57.3		20	22,410	-52.6	
30					19	24,275	-50.1	
20					8	26,946	-46.1	

Note: all observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20 *Air Force data for April, 1954

Standard pressure surface (mb.)	DENVER, COLO. (831 MB.)				FT. WORTH, TEX. (995 MB.)				OGDEN, UTAH (854 MB.)				RANTOUL, ILL. (990 MB.)				ROME, N. Y. (1001 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	1,661	12.5	34	30	178	21.2	65	30	1,450	11.4	37	30	227	11.6	75	29	146	6.7	71
1000---	30	72			30	130	15.3		30	106			30	145			29	162	6.7	66
950----	30	522			30	579	19.8	62	30	550			30	580	11.8	68	29	584	6.0	67
900----	30	986			30	1,039	17.4	66	30	1,009			30	1,026	10.1	66	29	1,025	3.6	88
850----	30	1,470			30	1,525	14.8	64	30	1,489	12.0	33	30	1,500	8.6	61	29	1,487	1.7	68
800----	30	1,982	12.2	33	30	2,035	11.8	66	30	1,995	9.3	44	30	2,000	6.1	77	29	1,973	- .5	66
750----	30	2,519	8.5	33	30	2,580	9.4	46	30	2,527	5.0	38	29	2,532	3.5	52	29	2,491	- 2.8	57
700----	30	3,084	3.9	88	30	3,142	6.1	99	30	3,083	.4	44	29	3,081	.1	55	29	3,031	- 5.7	55
650----	30	3,681	- .9	41	30	3,748	2.1	34	30	3,671	- 4.5	50	29	3,674	- 3.8	49	28	3,607	- 9.2	52
600----	30	4,314	- 6.2	44	30	4,386	- 2.3	33	30	4,297	- 9.3	55	29	4,298	- 7.9	44	28	4,219	-12.8	55
550----	30	4,989	-11.8	48	30	5,069	- 7.3		30	4,963	-14.0	48	29	4,971	-12.4	39	28	4,877	-16.9	48
500----	30	5,710	-17.3	55	30	5,806	-12.5		30	5,680	-19.1	55	29	5,690	-17.3	99	28	5,586	-21.4	55
450----	30	6,494	-23.0	37	30	6,611	-18.2		30	6,457	-24.7	50	28	6,488	-22.6		28	6,355	-26.8	
400----	30	7,342	-29.5		30	7,471	-24.8		30	7,300	-30.9	55	28	7,331	-28.7		28	7,192	-33.2	
350----	30	8,280	-37.0		30	8,427	-32.0		30	8,233	-38.1		27	8,270	-35.8		28	8,116	-40.0	
300----	30	9,327	-45.1		30	9,497	-40.5		30	9,275	-46.3		26	9,322	-44.0		28	9,150	-47.4	
250----	30	10,519	-54.3		29	10,709	-50.3		30	10,459	-55.6		26	10,520	-53.2		28	10,333	-55.0	
200----	30	11,921	-62.0		27	12,132	-60.6		29	11,858	-61.1		23	11,923	-61.2		27	11,737	-60.9	
175----	27	12,745	-61.7		26	12,956	-63.2		27	12,686	-61.1		21	12,748	-63.7		26	12,555	-61.8	
150----	24	13,697	-61.0		22	13,894	-63.0		23	13,644	-60.3		17	13,689	-61.1		21	13,491	-59.1	
125----	17	14,824	-61.2		13	15,011	-64.9		21	14,779	-61.0		11	14,813	-60.7		17	14,641	-58.5	
100----	9	16,206	-61.6						12	16,158	-62.4		7	16,176	-62.4		14	16,050	-59.6	
80-----									5	17,519	-61.7						5	17,474	-59.3	

* May data for the above Air Force stations will be included in the September issue of this publication.

Note: All observations scheduled at 0300, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Table 21

AUGUST 1954

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	173	4.6	31	230	2.2	31	18	1.8	30	111	1.9	31	312	4.5	31	131	6.7
500	--	---	----	--	---	----	--	---	----	--	---	----	--	---	----	31	141	7.3
1,000	31	166	5.7	--	---	----	--	---	----	30	134	2.0	31	311	4.3	27	150	7.2
1,500	31	163	4.9	--	---	----	31	342	1.0	30	190	2.4	31	312	3.0	26	156	6.2
2,000	31	168	5.0	31	242	2.6	31	245	1.0	29	235	3.7	30	265	1.7	24	154	5.5
2,500	31	172	5.0	31	232	2.5	30	238	2.7	27	257	5.7	30	228	4.3	22	143	4.5
3,000	26	187	4.4	29	219	2.5	29	251	5.2	26	262	8.1	30	225	6.7	22	138	4.1
4,000	22	191	3.5	28	227	1.7	25	251	9.3	21	274	11.4	29	216	9.6	20	123	4.5
5,000	14	200	4.4	27	214	1.9	22	252	12.1	14	278	13.6	27	226	11.1	18	125	4.8
6,000	14	195	4.3	25	231	3.5	21	248	14.5	12	266	13.2	26	227	13.7	14	120	4.3
8,000				19	226	5.4							17	242	18.5	12	93	6.1
10,000				11	232	6.0												
12,000																		
14,000																		
16,000																		

Altitude (meters) m.s.l.	* Buffalo, N. Y. (182 m.)			Burlington, Vt. (100 m.)			Charleston, S. C. (16 m.)			Cincinnati, Ohio (273 m.)			% El Paso, Tex. (1,198 m.)			Ely, Nev. (1,910 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	264	2.0	30	295	1.5	31	157	3.1	31	318	1.1	31	179	2.2	31	194	6.7
500	30	275	3.1	30	272	2.8	31	153	2.4	31	312	1.5	--	---	----	--	---	----
1,000	30	282	4.2	30	283	4.5	31	306	.7	31	294	2.8	--	---	----	--	---	----
1,500	30	290	5.5	27	283	5.0	30	337	2.7	29	287	5.2	31	181	2.4	--	---	----
2,000	30	292	7.2	22	286	7.5	25	337	3.5	25	282	7.1	31	185	2.0	31	198	6.8
2,500	30	294	7.9	19	289	7.9	23	339	3.6	22	283	8.5	30	181	1.5	31	208	6.5
3,000	30	295	9.2	19	296	9.5	21	324	3.5	16	287	9.6	29	186	1.8	31	210	6.5
4,000	28	288	11.1	16	293	13.6	16	305	3.9	11	290	10.5	27	163	2.4	31	219	7.9
5,000	28	288	13.5	15	293	15.7	13	299	3.6				25	178	3.1	29	225	10.0
6,000	28	290	17.0	12	289	20.2	13	296	5.6				23	184	3.9	25	229	10.9
8,000	28	292	21.6	12	281	25.9	12	299	3.4				20	193	4.8	12	243	15.0
10,000	26	288	26.1				11	282	3.3				19	189	4.3			
12,000	22	283	29.8										18	153	1.7			
14,000	22	280	25.2										17	239	2.5			
16,000	18	282	16.0										14	176	3.8			

Altitude (meters) m.s.l.	Grand Junction, Colo. (1,475 m.)			Green Bay, Wis. (210 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Little Rock, Ark. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	254	2.3	31	275	0.6	31	271	0.8	30	297	1.2	31	88	2.8	31	193	1.3
500	--	---	----	31	271	1.6	31	270	1.6	--	---	----	30	103	2.5	31	215	1.8
1,000	--	---	----	30	270	2.7	31	286	2.5	30	312	1.2	28	67	1.1	31	217	2.5
1,500	31	254	2.2	24	287	3.6	29	306	4.0	29	247	1.7	28	344	1.0	31	230	3.2
2,000	31	256	2.1	23	298	4.8	29	307	5.6	28	235	3.2	26	1	2.0	29	234	2.9
2,500	31	251	2.4	20	305	6.6	27	308	6.9	25	243	5.4	21	15	3.2	27	246	3.1
3,000	31	242	3.4	17	297	8.6	26	303	7.8	21	250	8.2	21	10	3.2	23	272	2.5
4,000	30	235	5.7	12	298	11.3	21	298	9.0	16	250	10.6	17	17	2.8	19	279	4.5
5,000	28	232	7.3	10	305	11.4	16	296	10.3	12	256	15.3	15	338	2.4	14	294	4.4
6,000	26	237	8.7	10	295	14.4	12	294	11.3	11	258	18.7	14	340	2.0	12	321	6.0
8,000	21	241	11.9										10	64	3.2			
10,000	14	253	17.4															
12,000	10	247	23.8															

Altitude (meters) m.s.l.	Medford, Ore. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			Oakland, Calif. (8 m.)			Omaha, Nebr. (306 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	288	1.5	30	114	3.4	31	203	2.0	31	292	1.8	29	273	5.2	30	137	2.4
500	31	290	1.7	30	112	3.8	31	200	1.3	31	284	2.8	28	266	4.5	30	148	3.4
1,000	31	307	2.1	29	94	2.4	31	187	.4	31	282	3.8	27	258	3.0	28	168	3.9
1,500	31	285	1.5	29	64	1.7	30	16	1.2	31	280	4.7	26	255	2.9	27	208	4.1
2,000	29	230	2.4	29	66	1.8	24	28	1.2	29	285	5.4	26	237	2.5	26	248	5.6
2,500	26	231	3.8	27	75	2.2	23	40	.9	27	291	6.0	26	225	3.4	24	263	7.1
3,000	25	241	4.0	27	87	1.9	18	60	2.2	24	293	6.5	26	215	4.7	20	260	9.3
4,000	24	248	5.9	21	131	1.6	12	28	2.4	22	301	7.3	26	237	6.3	19	279	11.1
5,000	22	254	7.9	20	83	2.5				19	299	8.9	26	238	8.7	17	291	11.5
6,000	21	255	10.1	20	92	2.4				15	292	8.4	24	237	9.4	15	291	13.1
8,000	20	259	13.9	14	97	1.4				11	295	7.3	18	243	12.4	12	288	14.8
10,000	11	257	15.2										11	244	15.1			
12,000																		

Altitude (meters) m.s.l.	Phoenix, Ariz. (345 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			** Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (725 m.)			‡ Washington, D. C. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	184	0.9	31	96	1.3	30	242	0.4	30	160	4.7	31	267	3.1	31	292	3.2	30	218	3.1	31	280	1.7
500	31	188	1.2	--	---	----	30	220	.5	30	154	5.3	29	274	2.4	31	310	4.4	--	---	----	31	284	3.1
1,000	31	206	1.1	31	100	1.4	29	248	.9	30	151	5.1	27	175	1.8	31	305	4.8	30	215	3.5	31	288	4.6
1,500	31	194	1.1	31	124	1.8	25	282	2.0	30	152	5.3	27	188	2.3	31	300	5.1	29	219	3.7	31	286	6.1
2,000	31	214	1.7	30	160	1.9	25	298	4.8	28	149	5.7	27	206	2.8	31	304	6.6	25	213	4.0	31	290	8.3
2,500	30	230	1.9	29	217	3.8	23	296	7.7	25	154	5.5	26	211	4.2	31	301	7.5	25	222	5.5	31	293	9.8
3,000	30	216	2.2	28	250	5.3	23	296	9.4	24	160	5.3	26	217	5.1	31	301	9.1	24	220	7.1	31	292	11.0
4,000	28	187	2.6	25	257	8.0	16	287	10.9	22	167	3.2	26	207	6.2	31	297	11.8	22	224	9.3	30	288	11.9
5,000	27	176	2.8	25	262	10.0	15	291	13.8	18	171	3.3	24	215	6.5	31	300	14.0	16	226	10.8	30	284	14.2
6,000	22	215	3.2	22	264	11.8	15	288	15.5	16	174	2.5	24	223	6.4	30	301	16.6	13	225	13.5	30	281	16.0
8,000	19	216	5.0	14	258	15.6	10	280	22.3				20	241	10.7	30	293	21.1				30	280	18.7
10,000	16	211	8.7										19	238	14.3	30	292	27.8				30	280	22.1
12,000													13	243	16.0	30	292	33.7				29	277	23.0
14,000																29	295	25.9				29	275	21.9
16,000																27	293	17.0				29	282	14.0

% (Cont'd.)
18,000 m., 10 obs. 126 dir., 3.9 speed

* Rawin Data (Cont'd.)
18,000 m., 15 obs. 295 dir., 7.3 speed
20,000 m., 13 obs. 301 dir., 2.6 speed
22,000 m., 11 obs. 207 dir., .2 speed

** Rawin Data (Cont'd.)
18,000 m., 25 obs. 301 dir., 8.0 speed
20,000 m., 19 obs. 317 dir., 2.6 speed
22,000 m., 13 obs. 68 dir., 1.4 speed
24,000 m., 11 obs. 93 dir., 3.3 speed
26,000 m., 10 obs. 96 dir., 3.1 speed

‡ Rawin Data (Cont'd.)
18,000 m., 28 obs. 285 dir., 3.0 speed
20,000 m., 27 obs. 158 dir., 1.2 speed
22,000 m., 26 obs. 104 dir., 3.2 speed
24,000 m., 26 obs. 83 dir., 6.7 speed
26,000 m., 20 obs. 86 dir., 10.3 speed

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

RAWIN DATA

Average monthly resultant winds

Table 22

AUGUST 1954

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Buffalo, N.Y. (182 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S. C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N. C. (275 m.)			Hatteras, N. C. (3 m.)			Int. Falls, Minn. (358 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface----------	31	121	2.9	31	89	2.3	31	122	5.2	31	221	0.8	31	175	0.9	31	264	1.8	31	196	0.9	31	117	2.5	31	65	0.3	31	295	0.3	30	189	2.7	31	51	0.3
500------------	--	---	----	--	---	----	31	136	9.4	30	293	2.8	31	126	2.0	31	297	4.3	31	197	2.5	31	143	4.2	--	---	----	31	272	1.7	28	231	4.6	31	334	.4
1,000----------	--	---	----	31	127	3.2	31	136	8.9	30	298	3.7	31	96	3.0	31	306	6.0	31	312	1.2	31	192	4.2	--	---	----	31	276	2.5	29	258	4.6	31	284	2.4
1,500----------	--	---	----	31	169	2.6	31	136	7.0	30	289	4.9	30	95	3.7	30	308	5.5	30	342	3.2	31	234	5.0	31	50	.2	31	284	3.9	29	278	5.0	31	282	3.9
2,000----------	31	157	2.4	31	231	3.4	31	133	5.6	31	293	6.7	29	89	4.3	30	300	6.0	30	342	4.3	31	249	6.3	31	236	2.3	31	292	5.4	28	288	4.8	31	289	4.9
2,500----------	31	178	1.8	30	272	5.2	31	122	5.0	31	289	8.4	29	85	4.6	30	294	6.9	30	349	4.4	31	262	7.0	31	246	3.3	30	295	6.2	29	283	4.9	31	296	6.4
3,000----------	31	197	1.7	30	277	7.1	31	122	4.7	31	290	9.4	29	86	4.8	30	290	7.4	31	345	4.3	31	278	7.5	31	234	3.7	30	300	6.6	28	276	5.5	31	297	8.4
4,000----------	31	258	.9	30	281	9.6	31	114	4.1	30	294	11.6	29	78	3.7	29	283	9.4	30	335	4.2	31	291	8.7	31	225	4.8	28	303	7.4	28	285	6.8	30	302	11.2
5,000----------	31	278	1.9	29	279	12.5	31	104	4.4	30	292	13.1	29	78	3.1	29	282	12.5	29	338	3.2	31	295	9.2	31	217	6.2	29	307	7.7	28	285	7.0	29	299	14.5
6,000----------	31	261	3.5	29	280	15.1	31	103	4.0	30	291	16.1	29	75	3.4	28	279	14.3	28	325	3.1	31	292	9.9	31	231	7.9	29	299	8.8	28	280	7.6	29	293	17.5
8,000----------	31	234	6.2	26	271	19.6	31	92	3.6	30	293	21.3	29	86	2.8	25	284	15.9	25	318	4.0	31	283	12.7	30	242	13.3	28	295	11.4	28	280	10.4	23	299	24.5
10,000---------	30	227	9.0	19	265	23.8	31	87	4.4	30	283	27.4	29	65	3.5	17	266	13.5	27	330	3.5	30	277	15.8	25	241	16.7	26	285	10.7	24	283	8.8	11	291	30.6
12,000---------	28	228	11.1	13	267	27.8	31	88	4.8	30	281	31.9	29	86	4.3	15	265	17.4	26	11	1.4	30	283	17.5	18	231	20.9	23	281	10.2	23	283	10.3			
14,000---------	24	236	6.4				31	83	5.6	25	285	26.3	28	97	3.9	14	270	14.6	26	269	5.0	28	284	16.1	13	229	20.6	21	286	11.1	23	287	12.1			
16,000---------	20	227	4.8				28	83	5.0				24	96	3.9	12	261	9.9	25	26	2.4	25	286	8.5				18	307	5.5	20	316	5.4			
18,000---------	15	104	2.4				23	87	12.5				24	88	7.8	11	264	6.4	22	92	3.0	17	292	1.8				15	349	2.6	19	13	.3			
20,000---------	13	90	5.0				20	87	16.3				18	86	9.2				19	76	7.0	14	79	3.5				12	92	4.7	18	77	5.8			
22,000---------	11	93	11.3				18	80	10.0										19	85	14.3	15	85	6.7				12	83	7.7	16	84	9.6			
24,000---------							11	90	22.8										13	88	17.4	15	88	10.1				10	81	11.4						
26,000---------																						11	92	10.1												

Altitude (meters) m.s.l.	Little Rock, Ark. (80 m.)			Medford, Ore. (401 m.)			Miami, Fla. (12 m.)			Midland, Tex. (871 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			St. Cloud, Minn. (318 m.)			San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)		
Surface----------	31	147	2.0	31	339	3.6	31	100	1.1	31	151	3.2	31	241	2.8	31	193	0.6	31	276	4.4	31	166	3.8	31	109	2.4	31	109	0.7	30	153	5.7	31	82	3.7
500------------	31	175	5.2	31	339	4.2	31	118	2.9	--	---	----	31	261	6.4	31	252	1.4	31	272	5.6	30	166	6.5	--	---	----	31	103	.6	30	146	9.4	31	91	7.7
1,000----------	31	197	5.4	31	329	4.5	31	107	3.2	31	155	5.4	31	274	6.6	31	271	3.2	31	266	5.4	30	182	10.3	31	107	2.8	31	224	1.1	30	152	9.6	31	93	6.2
1,500----------	31	214	5.0	31	297	3.0	31	95	3.4	31	162	9.7	31	274	7.9	31	272	4.3	31	257	4.0	31	189	9.1	31	144	6.1	31	261	2.1	30	148	6.9	31	91	8.5
2,000----------	31	228	4.1	31	249	3.1	31	95	3.3	31	163	8.9	30	274	7.9	31	280	5.5	31	242	3.1	31	196	7.3	31	163	5.0	31	276	3.5	30	145	5.2	31	93	8.7
2,500----------	31	242	2.7	31	228	4.3	31	87	2.9	31	158	6.3	30	271	9.0	31	292	5.6	31	238	3.3	31	212	5.0	31	187	3.6	31	293	5.4	30	137	4.4	31	95	9.2
3,000----------	31	273	1.3	31	222	5.6	31	82	2.8	31	148	4.7	30	267	10.3	31	297	7.1	31	238	4.1	31	215	3.2	31	235	5.0	31	297	7.5	30	134	4.1	31	91	9.0
4,000----------	31	312	2.4	31	230	7.1	31	72	2.5	31	147	2.8	27	272	12.6	31	303	7.4	31	243	5.4	31	259	.4	31	269	8.4	31	298	9.6	30	138	3.4	31	96	8.3
5,000----------	30	324	3.1	30	235	8.8	31	70	2.9	31	143	2.9	25	275	14.7	31	309	7.1	31	243	8.0	31	263	1.9	30	278	11.7	30	295	11.7	28	134	3.3	31	92	7.1
6,000----------	30	313	3.9	31	242	11.9	31	94	3.2	30	136	2.1	24	273	16.3	31	307	7.8	30	246	10.7	31	274	3.5	30	275	13.9	30	291	14.4	28	113	2.8	31	93	6.2
8,000----------	30	282	5.3	28	256	14.9	29	72	2.8	29	158	2.8	19	271	20.7	29	295	10.0	28	252	14.8	31	268	5.3	27	263	17.1	29	284	19.8	27	105	2.6	31	104	5.0
10,000---------	26	266	5.4	22	259	15.4	29	50	2.6	28	128	1.4	12	276	20.2	29	286	11.2	26	246	19.6	31	274	6.0	23	253	23.2	26	274	27.0	26	104	2.1	31	115	4.5
12,000---------	23	266	6.8	18	247	19.7	29	32	1.3	27	19	.4				27	295	13.9	19	252	21.1	30	284	5.8	17	257	28.7	16	276	32.0	25	135	3.5	30	126	4.4
14,000---------	20	301	5.0	10	239	14.0	27	68	4.3	22	16	1.8				23	303	9.8				30	286	5.4	11	249	29.3	12	272	26.1	23	122	2.2	30	124	5.7
16,000---------	13	294	4.2				21	79	7.1	16	92	3.7				20	317	5.1				26	268	2.9				11	274	15.8	17	94	4.8	29	100	9.7
18,000---------							21	98	11.0	16	88	6.8				18	43	2.1				22	101	1.2				12	283	6.3	16	90	6.9	24	96	13.5
20,000---------							21	88	13.4	14	87	8.8				15	92	3.8				18	84	5.4				16	10	.6	15	91	11.2	23	84	19.2
22,000---------							19	81	17.5	11	79	12.1				15	75	8.1				16	87	9.0				17	73	1.2	14	85	13.6	21	88	21.5
24,000---------							12	83	21.8							13	89	11.3				14	91	13.2				13	42	5.0				17	90	24.6

Altitude (meters) m.s.l.	Santa Maria, Calif. (72 m.)			Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is., Wash. (33 m.)			Washington, D. C. (88 m.)		
Surface----------	31	269	3.6	31	287	1.0	31	194	1.1	31	196	2.1	31	252	0.5
500------------	31	316	2.6	31	310	2.2	--	---	----	30	267	2.7	31	271	2.2
1,000----------	31	326	2.2	31	308	4.1	31	207	2.1	30	269	2.1	31	281	3.9
1,500----------	31	64	1.2	31	303	4.8	31	227	3.1	30	258	1.4	31	285	5.2
2,000----------	31	123	1.7	31	308	5.4	31	238	4.0	31	294	1.2	31	292	6.7
2,500----------	31	182	1.9	31	304	6.4	31	237	4.3	31	305	1.6	31	297	7.7
3,000----------	31	217	3.3	31	304	8.1	31	234	5.9	31	300	2.2	31	295	9.3
4,000----------	31	238	5.7	31	301	10.2	31	229	7.8	31	298	2.9	31	289	11.1
5,000----------	31	241	7.4	31	299	12.6	31	231	9.8	30	265	3.2	31	290	11.8
6,000----------	31	240	9.1	30	298	15.7	31	233	11.0	29	246	3.8	30	290	14.0
8,000----------	31	237	13.1	29	293	23.3	31	227	15.2	26	268	5.1	30	288	17.9
10,000---------	27	236	17.3	29	292	30.8	30	233	18.0	21	277	5.5	30	286	21.2
12,000---------	21	237	18.9	27	292	36.1	29	236	19.5	20	261	5.2	29	283	22.5
14,000---------	17	236	13.2	20	293	28.9	28	233	14.9	21	237	4.7	28	281	21.4
16,000---------	16	219	9.2	13	300	18.6	18	249	7.8	21	202	2.9	27	295	12.5
18,000---------	16	146	1.6				14	243	2.4	20	252	1.4	24	300	4.3
20,000---------	16	83	5.2				10	74	3.0	17	65	1.1	23	76	1.9
22,000---------	16	89	10.2							15	90	2.6	20	75	5.9
24,000---------										12	72	4.0	19	91	10.0
26,000---------													11	98	12.1

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following Table 22 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

RAWIN DATA

Average monthly resultant winds

Table 22 * Air Force Data for April 1954.

Altitude (meters) m.s.l.	Denver, Colo. (1,661 m.)			Ft. Worth, Tex. (178 m.)			Ogden, Utah (1,450 m.)			Rantoul, Ill. (227 m.)			Rome, N. Y. (146 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	132	0.3	29	137	2.5	30	111	1.1	28	329	0.3	30	187	0.6
500	--	---	----	29	158	6.5	--	---	----	27	236	2.7	30	229	4.2
1,000	--	---	----	29	174	7.6	--	---	----	27	240	5.2	30	244	7.5
1,500	--	---	----	29	203	7.6	28	147	1.2	26	258	7.4	29	255	9.2
2,000	30	245	2.4	29	225	5.8	27	234	3.2	27	277	8.5	29	267	10.9
2,500	30	265	3.3	30	237	6.1	26	255	4.5	26	278	10.5	29	272	12.8
3,000	30	263	4.5	29	252	6.3	25	261	7.4	26	283	11.9	28	282	15.6
4,000	30	264	8.6	29	270	7.6	26	267	11.3	27	281	14.2	28	280	18.7
5,000	30	265	10.6	29	270	9.5	28	272	15.9	27	282	15.6	27	281	23.9
6,000	30	266	14.0	29	271	9.3	29	272	18.4	27	283	18.1	25	284	27.9
8,000	30	271	19.3	29	266	14.7	30	277	23.5	25	278	25.1	24	284	30.7
10,000	30	267	23.9	28	263	19.8	29	273	28.1	25	278	30.2	20	287	33.0
12,000	30	267	26.9	26	258	24.4	28	273	29.5	22	271	34.2	19	285	33.7
14,000	21	270	23.2	19	262	26.3	19	271	21.7	13	280	29.5	10	284	29.8
16,000							10	272	24.1						

* May data for the above Air Force stations will be included in the September issue of this publication.

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following Table 22 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun. AUGUST 1954

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
ALBUQUERQUE, N. MEX.									
	Air mass								
	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0
Aug.									
1	0.67	0.78	0.92	1.12	1.33	----	----	----	----
2	----	----	----	----	----	1.06	----	----	----
3	.39	.50	----	.84	----	----	----	----	----
4	----	----	.88	1.00	1.37	----	----	----	----
6	.73	.82	.91	1.08	1.25	----	----	----	----
8	.71	.80	.91	1.10	1.29	----	----	----	----
9	.81	.91	1.03	1.19	1.38	----	0.95	0.85	0.74
12	----	----	----	1.08	----	----	----	----	----
16	.79	.87	1.01	1.19	1.40	----	----	----	----
17	----	----	1.00	1.16	1.26	----	----	----	----
18	----	.83	----	----	----	----	.97	.86	----
19	----	.76	----	1.15	----	----	----	----	----
21	----	----	----	.95	----	----	----	----	----
22	----	----	.98	1.14	1.33	----	----	----	----
25	----	----	----	----	----	----	.95	.86	.77
26	.79	.88	.96	1.12	1.30	1.20	1.07	1.01	.89
27	.87	.94	1.05	1.15	1.53	1.30	1.18	1.05	.96
28	.92	1.00	1.11	1.25	1.39	1.20	1.02	.91	----
29	.71	.84	.96	1.12	1.35	----	----	----	----
30	.70	.81	.94	1.12	1.25	----	.99	.86	.77
31	.80	.89	1.01	1.17	1.33	1.33	.94	.82	.72
Averages	.74	.83	.91	1.11	1.34	1.18	1.01	.90	.81
Departures	-.02	-.04	-.07	-.03	-.05	-.01	-.13	-.03	-.04
MADISON, WIS.									
	Air mass								
	4.81	3.84	2.88	1.92	*1.0	1.92	2.88	3.84	4.81
Aug.									
2	0.56	0.66	0.83	1.01	----	----	----	----	----
3	.83	.94	1.05	1.19	----	----	----	----	----
5	.74	.83	.97	1.17	1.42	1.13	0.99	0.86	0.77
6	.60	.70	.86	1.04	1.32	----	----	----	----
10	.58	.70	.88	1.13	1.40	----	----	----	----
12	.79	.88	1.00	1.15	----	----	----	----	----
13	.52	.57	.71	.97	----	----	----	----	----
15	----	----	----	.98	----	----	----	----	----
31	.61	.73	.89	1.06	1.37	1.12	----	----	----
Averages	.66	.75	.90	1.08	1.38	(1.13)	(.99)	(.86)	(.77)
Departures	-.02	-.01	-.03	.03	.08	.09	.12	.03	.13

* Extrapolated

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
TABLE MOUNTAIN, CALIF.									
	Air mass								
	3.76	3.01	2.26	1.51	*1.0	1.51	2.26	3.01	3.76
Aug.									
9	----	----	----	1.31	----	----	----	----	----
12	----	----	----	1.40	----	----	----	----	----
16	----	----	----	1.43	----	----	----	----	----
17	----	----	----	1.42	----	----	----	----	----
18	----	----	----	1.43	----	----	----	----	----
22	----	----	----	1.35	----	----	----	----	----
23	----	----	----	1.35	----	----	----	----	----
24	----	----	----	1.45	----	----	----	----	----
29	1.03	1.07	1.23	1.35	----	----	----	----	----
Averages	(1.03)	(1.07)	(1.23)	1.39	----	----	----	----	----
Departures	-.03	-.07	.00	-.01	----	----	----	----	----
LINCOLN, NEBR.									
	Air mass								
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77
Aug.									
2	----	----	----	----	1.25	----	----	----	----
9	----	----	----	----	1.29	1.10	0.92	0.79	0.69
10	----	----	----	----	1.26	1.12	.99	.73	.62
27	----	----	----	----	1.24	1.12	1.01	.79	.56
Averages	----	----	----	----	1.26	1.11	.97	.77	.62
Departures	----	----	----	----	-.04	.06	.11	.04	.00
BLUE HILL, MASS.									
	Air mass								
	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86
Aug.									
5	0.62	0.74	0.94	1.13	----	----	----	----	----
12	.85	.94	----	----	----	----	----	----	----
13	.71	.82	.93	----	----	----	----	----	----
17	.93	1.01	1.13	1.26	----	1.18	1.15	0.93	0.83
22	.82	.90	1.03	1.20	----	----	----	----	----
27	.87	.96	1.04	1.18	----	1.22	1.08	.98	.88
28	----	----	----	----	----	1.15	1.00	.92	.85
29	.90	1.00	1.12	1.25	----	----	----	----	----
Averages	.81	.91	1.03	1.20	----	1.18	1.08	.94	.85
Departures	.14	.12	.13	.15	----	.08	.22	.22	.22

Langley is the unit used to denote one gram calorie per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

SOLAR RADIATION DATA

Table 31a Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	6	7	8	9	10	11	12		13	14	15	16	17	18	19		20	21	22	23	24	25	26	
Langleys	87	115	118	29	58	135	135	97	136	142	87	126	115	109	88	115	121	136	110	133	141	117	50	116
Date	27	28	29	30	31	1	2																	
Langleys	106	119	103	109	---	---	---	(109)																

Table 31b Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	6	7	8	9	10	11	12		13	14	15	16	17	18	19		20	21	22	23	24	25	26	
Langleys	156	323	388	40	68	347	348	239	379	368	118	250	396	371	71	279	234	137	376	342	211	220	59	227
Date	27	28	29	30	31	1	2																	
Langleys	364	182	379	119	---	---	---	(261)																

Table 31c Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Bill, Mass. during the month

								Avg								Avg								Avg
Date	6	7	8	9	10	11	12		13	14	15	16	17	18	19		20	21	22	23	24	25	26	
Langleys	148	284	286	30	65	293	215	189	307	287	96	318	344	344	78	253	254	146	351	346	256	307	58	246
Date	27	28	29	30	31	1	2																	
Langleys	371	203	334	169	---	---	---	(269)																

Table 31d Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	6	7	8	9	10	11	12		13	14	15	16	17	18	19		20	21	22	23	24	25	26	
Langleys	120	316	210	39	80	357	315	205	424	411	87	347	423	351	95	305	185	227	349	302	313	261	55	253
Date	27	28	29	30	31	1	2																	
Langleys	403	378	213	189	---	---	---	(296)																

Table 31e Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a Horizontal surface at Blue Bill, Mass. during the month

								Avg								Avg								Avg
Date	6	7	8	9	10	11	12		13	14	15	16	17	18	19		20	21	22	23	24	25	26	
Langleys	163	123	156	47	101	189	215	142	163	186	164	209	81	101	132	148	249	252	139	214	281	192	76	200
Date	27	28	29	30	31	1	2																	
Langleys	84	209	118	206	---	---	---	(154)																

Note: Langley is the unit used to denote one gram calorie per square centimeter.

--- Power off due to hurricane "Carol"

SOLAR RADIATION DATA

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.

	Aklavik, Mackenzie	Albuquerque, N.Mex.	Annette, Alaska	Astoria, Oreg.	Atlanta, Ga.	Barrow, Alaska	Bethel, Alaska	Bismark, N. Dak.	Blue Hill, Mass.	Boise, Idaho	Boston, Mass	Brownsville, Tex.
1954												
Aug. 6	554	704	195	383	320	308	130	288	176	640	217	695
Aug. 7	466	520	484	522	375	351	299	439	553	658	557	642
Aug. 8	(474)	745	640	485	366	---	211	618	541	638	---	680
Aug. 9	(510)	---	439	582	529	364	136	599	53	639	79	682
Aug. 10	(499)	544	210	617	697	501	152	340	102	621	138	685
Aug. 11	(486)	615	321	215	666	252	318	536	545	521	548	683
Aug. 12	(493)	672	277	361	481	140	368	599	423	486	---	680
Averages	(498)	633	366	452	491	319	231	488	342	601	308	678
Departures	---	---	---	---	---	---	---	---	-126	---	---	---
Aug. 13	430	712	519	186	576	182	273	---	565	489	516	698
Aug. 14	105	686	451	222	592	310	205	589	567	512	530	654
Aug. 15	126	673	444	491	574	448	564	483	178	601	203	337
Aug. 16	65	707	186	496	580	249	245	634	551	646	511	351
Aug. 17	117	656	179	395	406	209	95	154	702	658	650	599
Aug. 18	421	601	605	241	537	200	237	584	610	616	627	683
Aug. 19	447	677	608	331	486	294	204	618	148	392	150	667
Averages	244	673	428	337	536	270	260	511	474	559	455	570
Departures	---	---	---	---	---	---	---	---	11	---	---	---
Aug. 20	236	535	451	350	420	236	219	573	364	438	411	681
Aug. 21	244	504	436	351	574	317	303	402	272	561	287	651
Aug. 22	454	651	588	239	553	246	139	542	579	628	560	653
Aug. 23	375	510	571	456	496	238	90	607	543	545	547	619
Aug. 24	360	450	550	240	519	187	274	593	363	418	347	418
Aug. 25	(172)	678	565	298	504	203	195	545	423	280	447	519
Aug. 26	406	715	560	346	622	161	88	197	92	582	108	503
Averages	(321)	578	532	326	527	227	187	494	377	493	387	578
Departures	---	---	---	---	---	---	---	---	-93	---	---	---
Aug. 27	338	724	440	288	581	139	181	604	583	582	578	373
Aug. 28	273	708	480	338	461	130	169	572	329	539	382	261
Aug. 29	(304)	644	258	376	555	72	87	575	481	563	535	293
Aug. 30	161	636	304	186	594	108	98	541	240	547	221	605
Aug. 31	183	675	162	449	648	211	192	566	---	515	93	642
Sept. 1	371	675	352	538	624	116	249	580	---	569	475	584
Sept. 2	---	682	429	316	613	271	140	498	---	553	477	557
Averages	(272)	678	346	356	582	150	159	562	408	552	394	474
Departures	---	---	---	---	---	---	---	---	6	---	---	---
Accumulated Departures January 1 to September 2, 1954	---	---	---	---	---	---	---	---	---	---	---	---

	Canton Island, Pacific Area	Caribou, Me.	Charleston, S. C.	Columbia, Mo.	Davis, Calif.	Dodge City, Kans.	East Lansing, Mich.	East Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Ely, Nev.	Fairbanks, Alaska
1954												
Aug. 6	613	593	348	131	694	556	533	324	416	635	(737)	441
Aug. 7	---	559	611	473	650	462	545	(519)	554	691	739	580
Aug. 8	610	547	674	165	675	714	57	---	571	529	(735)	554
Aug. 9	642	(634)	638	705	673	704	385	83	272	404	466	525
Aug. 10	581	116	571	710	---	685	376	(203)	496	720	657	477
Aug. 11	579	160	745	100	668	(611)	452	590	199	612	571	468
Aug. 12	621	189	(540)	386	665	538	486	---	327	673	671	328
Averages	608	(400)	(589)	381	671	(610)	405	(344)	405	609	(654)	482
Departures	---	---	---	---	20	---	-7	-87	---	---	---	134
Aug. 13	543	616	593	441	633	650	545	577	543	713	605	549
Aug. 14	---	641	667	607	627	682	74	550	584	704	525	209
Aug. 15	---	250	656	650	643	536	441	216	254	703	(744)	394
Aug. 16	---	259	605	348	643	618	177	504	158	709	(732)	545
Aug. 17	---	263	465	632	642	656	437	642	590	733	723	530
Aug. 18	---	577	580	612	622	591	201	609	392	596	714	275
Aug. 19	599	493	651	176	622	568	398	249	255	655	705	253
Averages	---	443	602	495	633	614	325	478	397	688	(678)	394
Departures	---	---	---	---	16	---	-84	31	---	---	---	60
Aug. 20	---	358	704	500	506	445	463	216	310	642	625	284
Aug. 21	---	627	687	559	619	541	466	196	572	549	709	362
Aug. 22	---	628	---	538	618	270	444	608	390	548	697	478
Aug. 23	---	563	595	521	628	524	439	---	222	174	682	---
Aug. 24	---	240	623	637	560	638	284	---	191	601	682	135
Aug. 25	---	---	479	632	309	---	205	---	55	663	552	261
Aug. 26	---	612	554	536	312	---	258	194	83	656	675	198
Averages	---	505	607	560	507	484	365	304	260	548	660	286
Departures	---	---	---	---	-83	---	-44	-150	---	---	---	-6
Aug. 27	---	420	560	484	420	*	470	539	177	632	681	142
Aug. 28	---	391	463	439	570	---	281	350	516	672	564	221
Aug. 29	---	596	354	592	609	---	432	540	475	---	631	202
Aug. 30	---	552	474	636	596	---	349	---	459	576	498	233
Aug. 31	---	189	453	641	611	---	486	---	60	631	635	189
Sept. 1	---	290	262	642	582	---	425	---	523	635	366	358
Sept. 2	---	525	619	590	599	---	440	---	464	641	377	347
Averages	---	423	455	575	570	---	412	---	382	631	536	242
Departures	---	---	---	---	8	---	73	---	---	---	---	-15
Accumulated Departures January 1 to September 2, 1954	---	---	---	---	---	---	-420	---	---	---	---	---

	Ft. Worth, Tex.	Fresno, Calif.	Grand Junction,Colo.	Great Falls, Mont.	Greensboro, N. C.	Griffin, Ga.	Hatteras, N. C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.	Lake Charles, La.	Lander, Wyo.
1954												
Aug. 6	760	711	745	513	705	545	634	615	851	612	662	538
Aug. 7	773	695	763	716	702	266	752	576	814	662	652	670
Aug. 8	764	692	743	(683)	632	198	734	149	---	526	687	640
Aug. 9	504	680	658	602	405	449	655	569	795	441	618	657
Aug. 10	764	676	339	672	687	626	649	628	788	492	311	391
Aug. 11	745	680	677	644	728	563	717	399	803	378	680	577
Aug. 12	760	691	518	550	625	474	634	625	807	113	646	504
Averages	724	689	635	(626)	641	446	682	509	810	461	608	568
Departures	---	37	---	---	---	---	---	---	---	-23	---	---
Aug. 13	767	698	333	470	725	432	(719)	415	799	595	504	472
Aug. 14	738	687	706	(566)	489	443	731	384	789	472	539	651
Aug. 15	759	692	582	489	580	501	657	611	813	305	586	719
Aug. 16	743	688	568	438	---	427	696	399	800	482	---	738
Aug. 17	744	676	732	442	---	291	581	---	801	667	503	731
Aug. 18	733	664	739	634	---	527	598	---	785	592	355	727
Aug. 19	707	665	739	479	243	439	659	501	810	169	259	678
Averages	742	681	628	(503)	509	437	(663)	462	800	469	458	674
Departures	---	41	---	---	---	---	---	---	---	13	---	---
Aug. 20	704	669	445	464	638	384	673	416	755	355	377	346
Aug. 21	694	661	480	257	611	535	677	625	764	511	461	524
Aug. 22	414	623	686	538	180	524	621	547	751	451	370	673
Aug. 23	547	622	699	503	366	492	696	548	742	475	361	708
Aug. 24	643	651	673	438	418	454	482	485	754	376	216	616
Aug. 25	634	599	670	628	582	478	700	574	737	257	558	691
Aug. 26	712	649	708	(124)	547	543	654	348	772	151	615	627
Averages	621	639	623	(422)	477	487	643	506	754	368	422	598
Departures	---	26	---	---	---	---	---	---	---	-104	---	---
Aug. 27	646	633	709	574	550	546	567	351	771	621	446	711
Aug. 28	639	667	708	601	374	363	583	376	737	520	311	545
Aug. 29	683	618	685	---	442	507	634	582	725	172	540	679
Aug. 30	552	618	671	---	537	551	48	541	---	283	606	615
Aug. 31	353	607	611	623	624	586	628	561	704	40	581	569
Sept. 1	672	381	614	623	631	567	195	550	277	321	618	711
Sept. 2	699	575	476	566	622	575	687	450	500	509	612	371
Averages	606	585	639	598	540	528	478	487	619	352	532	600
Departures	---	1	---	---	---	---	---	---	---	-90	---	---
Accumulated Departures January 1 to September 2, 1954	---	6223	---	---	---	---	---	---	---	-1491	---	---

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

* Equipment inoperative.

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.-Continued

	Las Vegas, Nev.	Lincoln, Nebr.	Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBCO)	Madison, Wisc.	Medford, Ore.	Miami, Fla.	Midland, Tex.	Nashville, Tenn.	Newport, R. I.	New York, N. Y.	Oak Ridge, Tenn.	Oklahoma City, Okla	Ottawa, Ontario	Phoenix, Ariz.	Prosser 4 NE, Wash.	Rapid City, S. Dak.	Riverside, Calif.	St. Cloud, Minn.	San Antonio, Tex.	Santa Maria, Calif.	S. Ste. Marie, Mich.	Sayville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle, Wash. (WBAS)	State College, Pa.	Stillwater, Okla.	Swan Island, W. I.	Tampa, Fla.	Toronto, Canada	Upton, N. Y.	Wake Island, Pacific Area	Washington, D. C. (Silver Hill Obs.)	Winnipeg, Manitoba
1954																																				
Aug. 6------	728	68	565	468	502	618	753	626	638	229	478	692	430	567	524	695	713	212	614	671	746	665	(681)	606	473	---	485	529	470	680	636	596	572	561	628	402
Aug. 7------	731	64	610	569	590	537	736	527	665	606	615	641	610	615	563	713	710	613	551	289	729	587	639	666	562	571	649	585	578	638	357	475	672	615	623	282
Aug. 8------	705	636	589	599	594	452	728	454	588	554	646	563	317	---	498	657	736	414	606	479	750	600	247	611	405	---	383	491	273	655	319	248	---	674	559	480
Aug. 9------	582	670	670	540	586	556	726	364	639	438	64	35	291	729	546	694	736	687	674	587	679	588	496	45	350	---	502	76	640	595	484	384	---	(667)	246	559
Aug. 10------	604	651	657	524	569	672	728	419	652	663	227	632	592	719	378	712	738	588	576	655	732	619	317	505	441	---	651	397	631	594	591	265	499	656	(484)	462
Aug. 11------	651	206	473	538	596	702	711	275	716	618	633	622	642	719	204	705	717	375	637	703	727	471	268	555	450	---	498	426	530	656	657	443	533	93	(630)	544
Aug. 12------	688	206	640	426	414	(643)	697	548	717	147	614	421	116	683	265	301	350	576	430	397	748	491	(602)	628	235	---	365	280	569	581	572	508	657	555	650	591
Averages------	670	357	601	523	713	(597)	726	459	659	465	468	515	428	672	425	640	671	495	584	540	730	574	(464)	517	416	---	505	398	527	628	517	417	587	(546)	(546)	474
Departures----	---	---	---	---	---	115	---	---	---	---	-8	90	---	---	---	---	---	---	25	---	---	---	---	---	---	---	---	-51	---	---	---	---	---	---	---	---
Aug. 13------	709	334	644	582	525	638	450	686	684	320	570	629	359	702	679	669	634	451	689	354	747	615	(453)	643	472	629	305	605	614	464	440	572	(672)	605	624	424
Aug. 14------	723	600	645	552	594	305	---	691	711	555	674	632	490	632	581	---	621	603	625	541	689	703	330	629	470	567	191	384	529	116	517	328	642	701	530	615
Aug. 15------	726	632	603	692	705	601	527	619	753	642	155	166	540	---	368	705	464	385	722	364	604	716	535	119	134	203	313	215	522	660	601	272	---	684	222	570
Aug. 16------	721	543	612	---	681	269	722	463	684	593	558	583	567	691	(270)	707	628	474	727	686	681	719	647	557	427	541	228	419	578	451	551	275	---	482	536	640
Aug. 17------	698	596	576	647	645	321	702	661	711	394	704	701	333	680	666	713	651	643	713	604	646	650	670	717	572	648	361	571	570	544	610	580	---	655	645	279
Aug. 18------	703	179	616	559	554	346	662	519	657	624	673	643	556	695	(594)	698	593	609	695	570	742	567	358	674	535	645	281	526	607	663	442	397	---	573	509	298
Aug. 19------	664	487	598	578	550	574	494	658	---	305	332	435	357	548	536	595	380	515	623	603	508	619	380	456	221	498	156	382	349	---	608	354	---	520	408	532
Averages------	706	482	614	602	608	436	593	614	700	490	524	541	458	658	(528)	681	567	526	685	532	659	656	(482)	542	404	533	262	443	538	504	538	397	---	603	496	480
Departures----	---	-11	---	---	---	-24	---	---	---	---	63	149	---	---	---	---	---	---	123	---	---	---	---	---	---	---	---	0	---	---	---	---	---	---	---	---
Aug. 20------	682	608	505	510	570	542	467	499	*	406	263	274	524	594	627	493	393	391	685	565	633	553	631	297	394	498	203	194	603	---	561	485	---	653	450	586
Aug. 21------	661	195	422	394	385	465	691	543	---	397	187	93	477	593	613	520	604	545	592	373	718	480	632	91	420	76	564	326	491	---	356	591	---	664	91	200
Aug. 22------	664	368	569	481	394	398	680	125	---	521	658	575	600	645	572	680	560	569	499	99	511	(586)	471	629	525	580	154	545	564	566	350	448	---	651	587	335
Aug. 23------	645	339	545	179	404	524	672	507	---	599	625	605	486	545	501	691	287	664	499	598	586	580	285	649	510	613	454	442	403	---	508	468	---	---	531	597
Aug. 24------	655	584	442	439	386	374	660	580	---	458	600	464	393	603	412	(682)	595	648	579	615	536	302	570	602	300	571	318	389	501	564	397	356	593	680	512	---
Aug. 25------	629	533	469	522	537	159	164	610	---	586	340	366	513	621	560	675	362	584	628	456	605	566	351	378	450	514	422	396	573	670	498	505	367	636	422	---
Aug. 26------	661	556	526	525	535	332	438	634	---	601	142	219	351	615	637	717	463	569	660	229	665	686	569	160	156	338	293	164	490	611	466	459	---	615	435	---
Averages------	657	455	497	436	459	399	539	500	---	510	402	371	478	602	560	(637)	466	567	592	419	608	(536)	502	401	394	456	344	351	518	573	477	473	---	650	432	430
Departures----	---	-18	---	---	---	-54	---	---	---	---	-67	-14	---	---	---	---	---	---	46	---	---	---	---	---	---	---	---	-105	---	---	---	---	---	---	---	---
Aug. 27------	658	575	517	577	621	259	362	620	---	543	647	535	376	667	622	692	464	561	568	214	665	644	421	666	535	302	434	415	581	625	322	550	---	648	108	---
Aug. 28------	558	510	480	631	592	404	236	582	---	504	458	353	253	633	592	682	384	636	639	609	439	663	(117)	300	367	191	281	382	540	521	620	344	---	674	168	---
Aug. 29------	607	277	596	632	641	562	542	366	---	---	622	456	570	---	(186)	643	623	322	661	594	386	660	133	632	268	524	486	386	539	---	100	334	614	652	463	---
Aug. 30------	570	479	577	618	630	469	433	558	---	593	564	211	513	583	(144)	643	555	582	631	493	529	652	493	494	110	400	127	211	493	599	587	141	(464)	622	435	---
Aug. 31------	500	571	603	588	584	589	645	315	409	651	---	259	439	646	79	647	616	579	509	576	713	658	589	---	77	350	580	271	564	667	503	115	---	---	466	---
Sept. 1------	---	561	615	308	319	516	635	129	617	641	---	531	628	656	380	591	603	613	517	571	683	306	445	---	280	536	523	264	576	656	444	513	---	608	573	406
Sept. 2------	---	540	594	604	580	550	482	596	643	627	---	588	602	641	436	570	590	301	549	556	636	601	382	---	489	559	424	448	573	609	566	425	---	598	560	295
Averages------	579	502	569	565	567	478	476	452	---	593	573	419	483	638	(349)	638	548	513	582	516	579	598	(369)	523	304	409	408	340	552	611	449	346	---	634	396	---
Departures----	---	50	---	---	---	64	---	---	---	---	147	56	---	---	---	---	---	---	66	---	---	---	---	---	---	---	---	-80	---	---	---	---	---	---	---	---
Accumulated Departures January 1 to September 2, 1954	---	---	---	---	---	804	---	---	---	---	---	---	---	---	---	---	---	---	13013	---	---	---	---	---	---	---	---	3360	---	---	---	---	---	---	---	---

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

NWRC, Asheville, N.C. --- 11/10/54 --- 1800

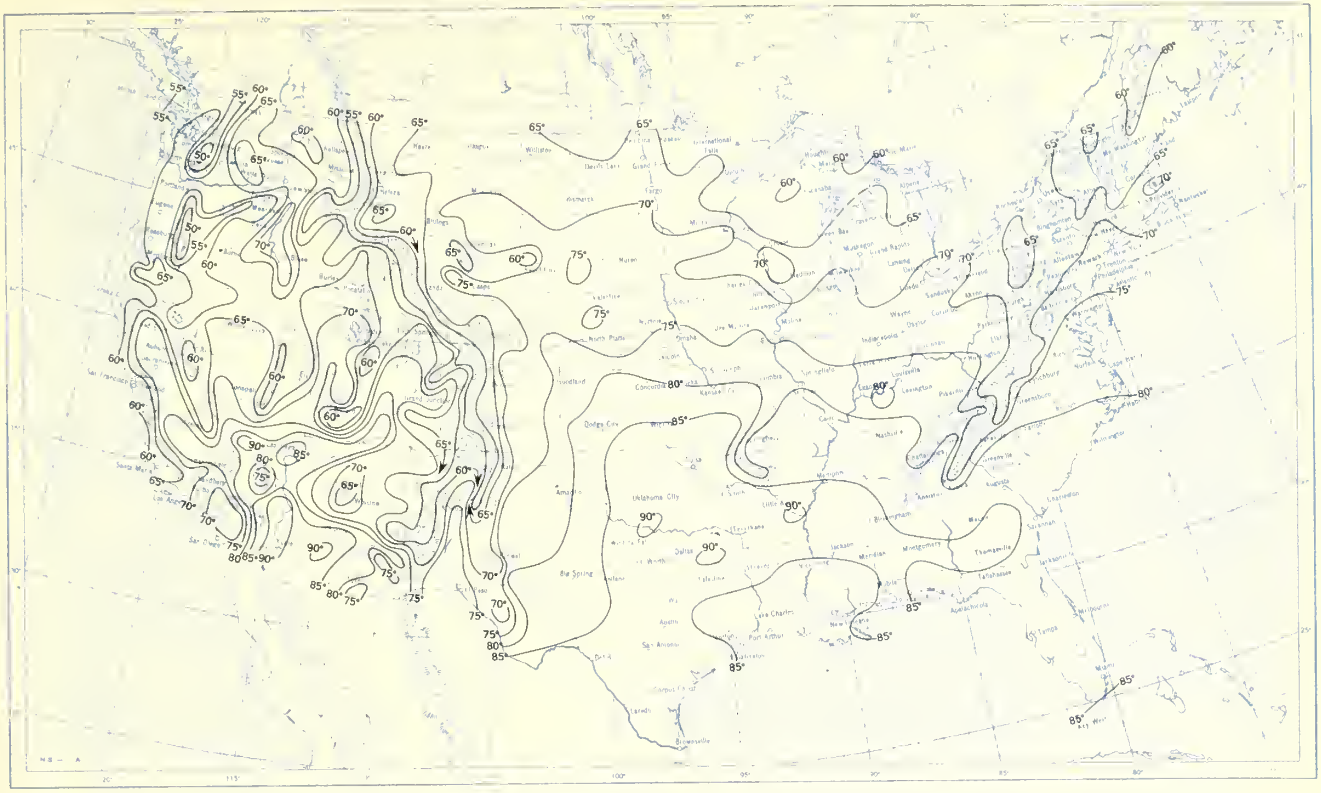
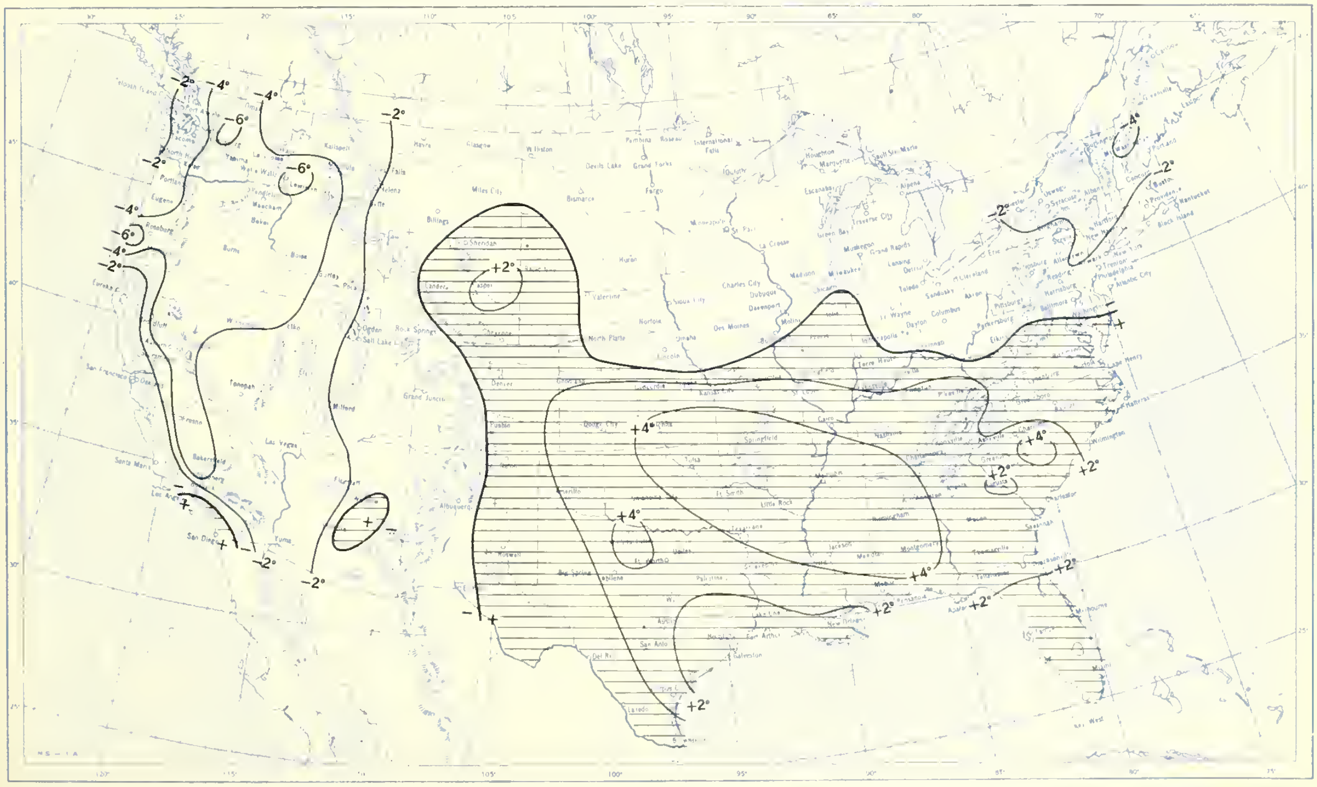


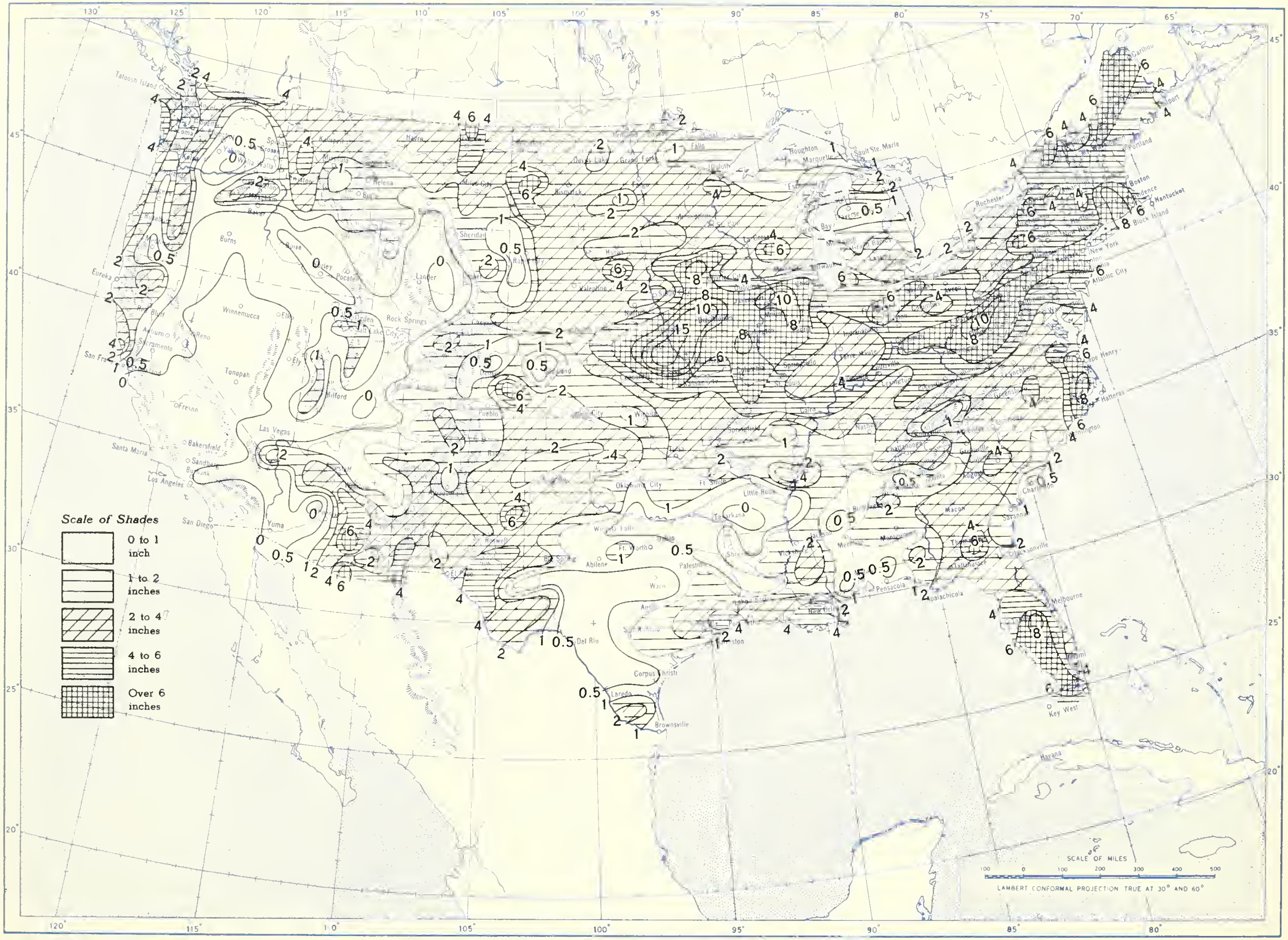
Chart I. A. Average Temperature (°F.) at Surface, August 1954.



B. Departure of Average Temperature from Normal (°F.), August 1954.

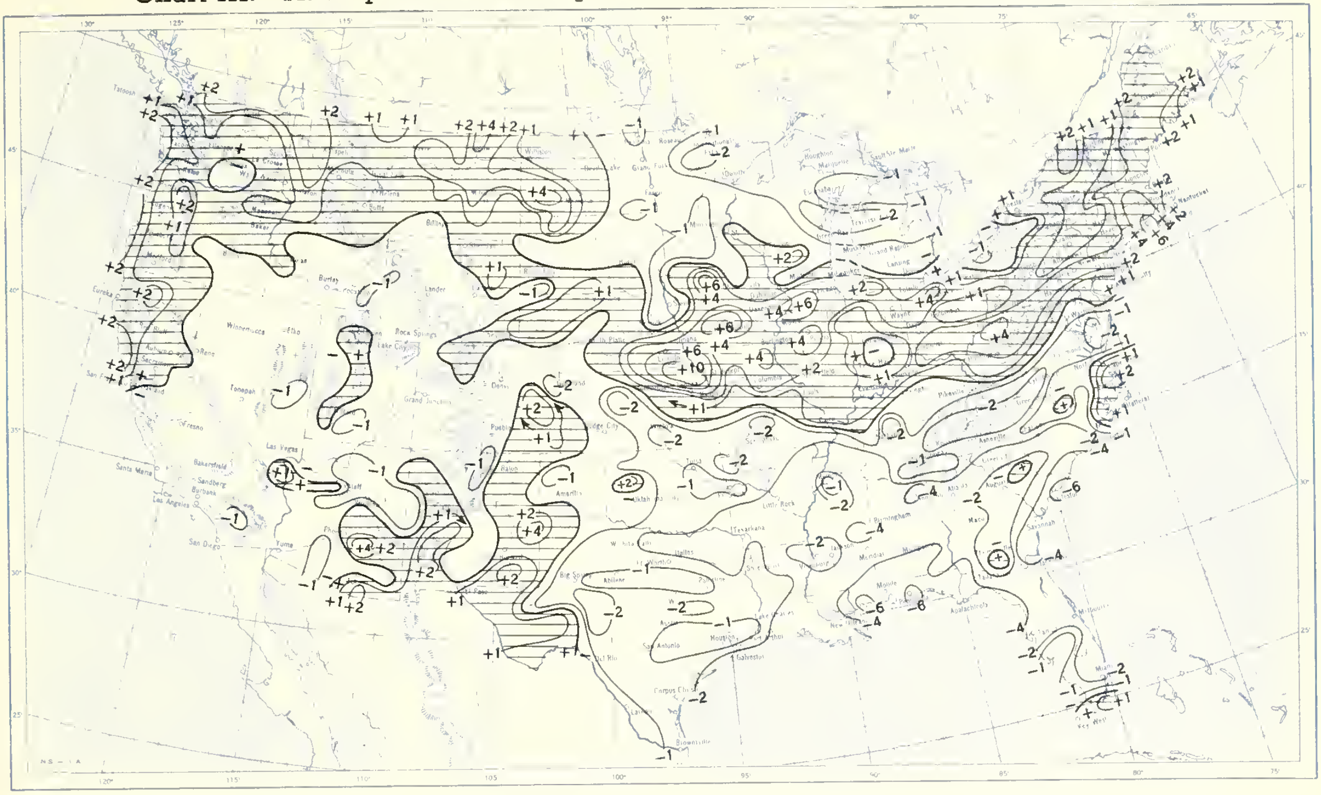
A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.
B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), August 1954.

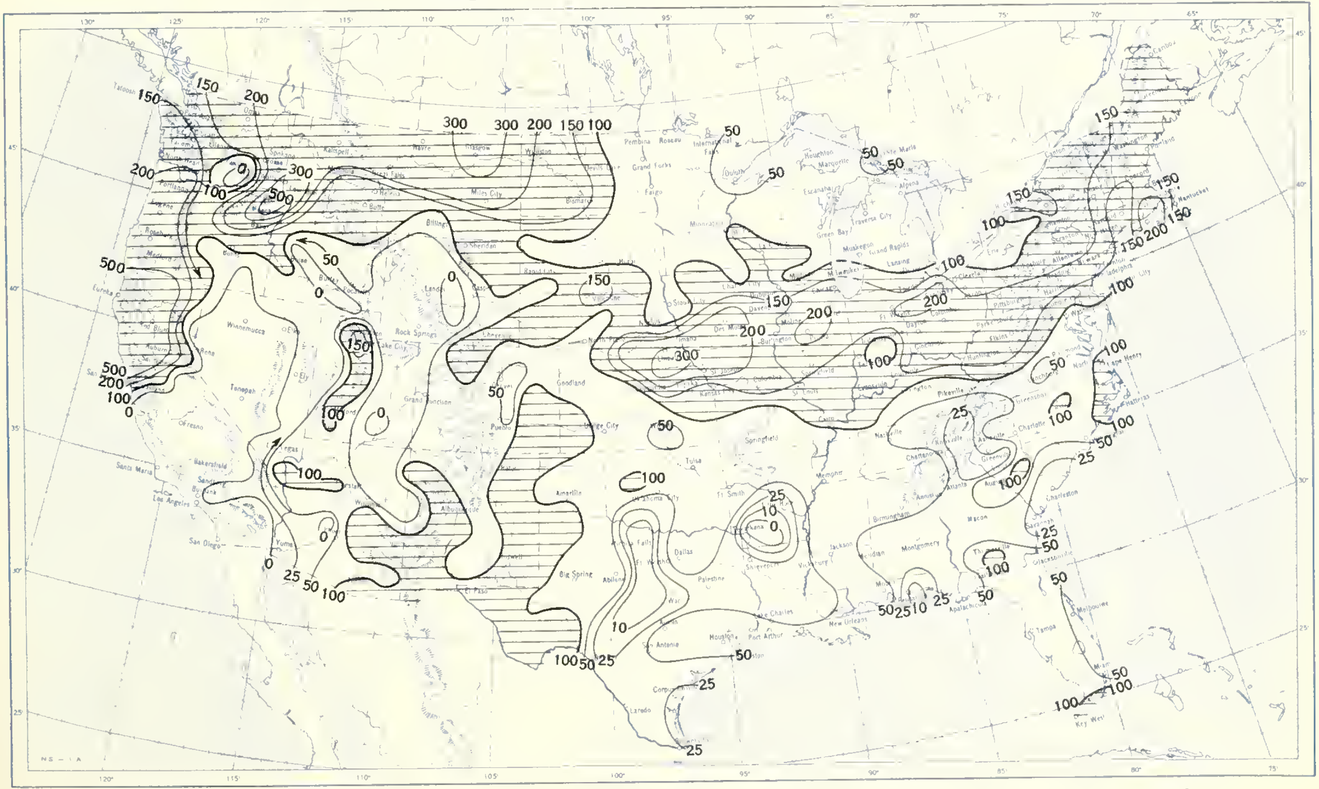


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), August 1954.

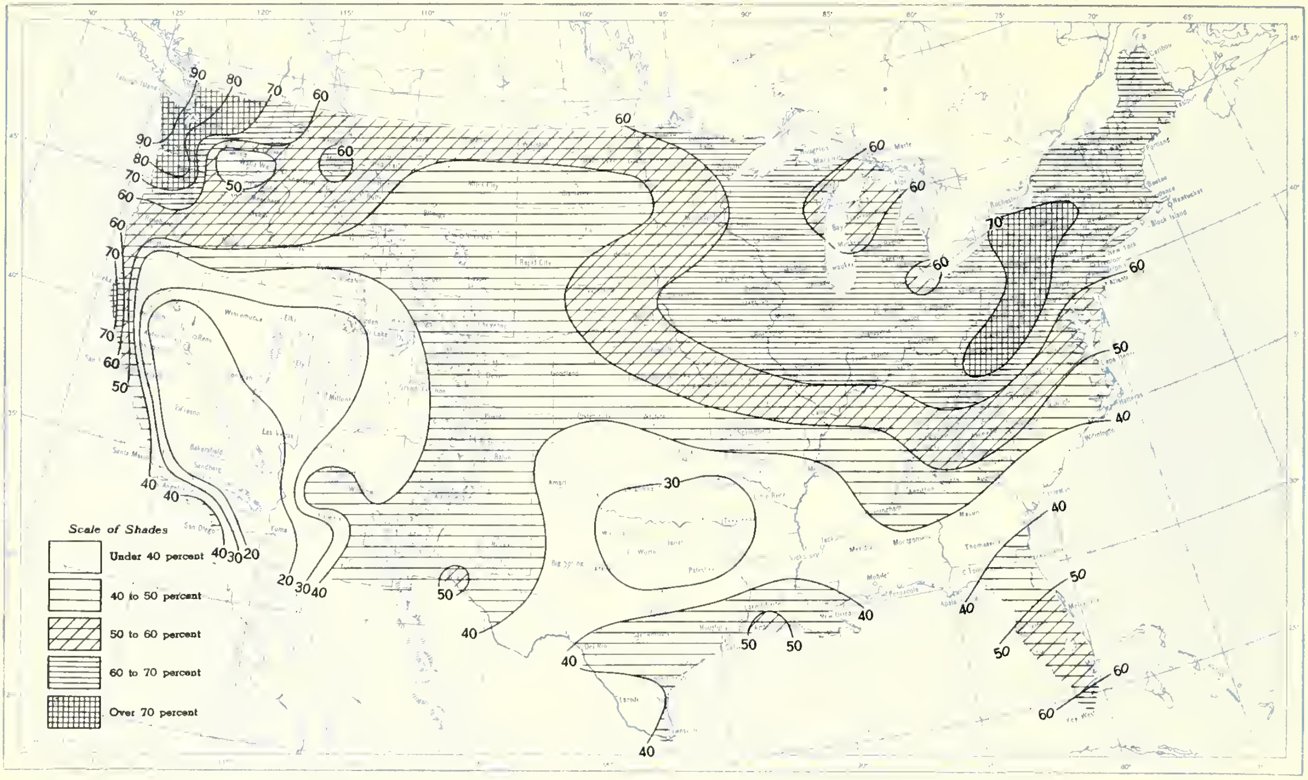


B. Percentage of Normal Precipitation, August 1954.

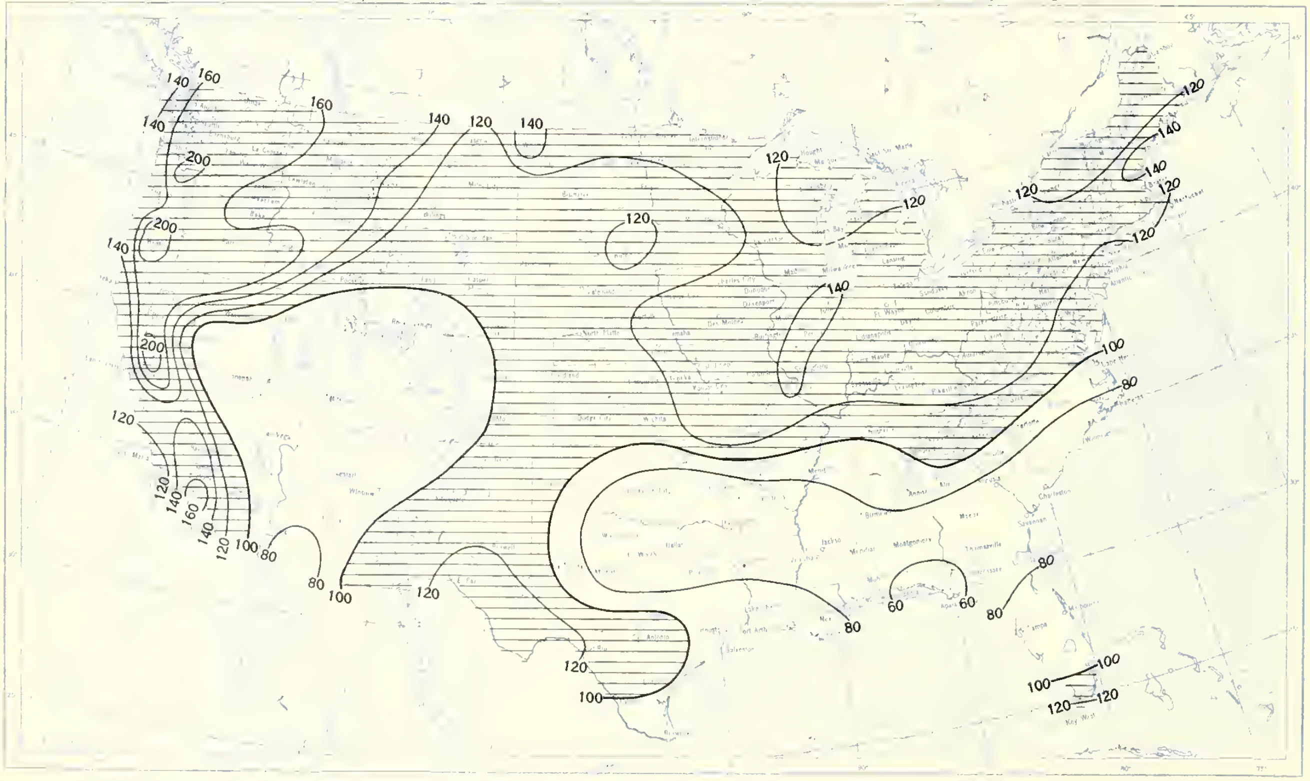


Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, August 1954.

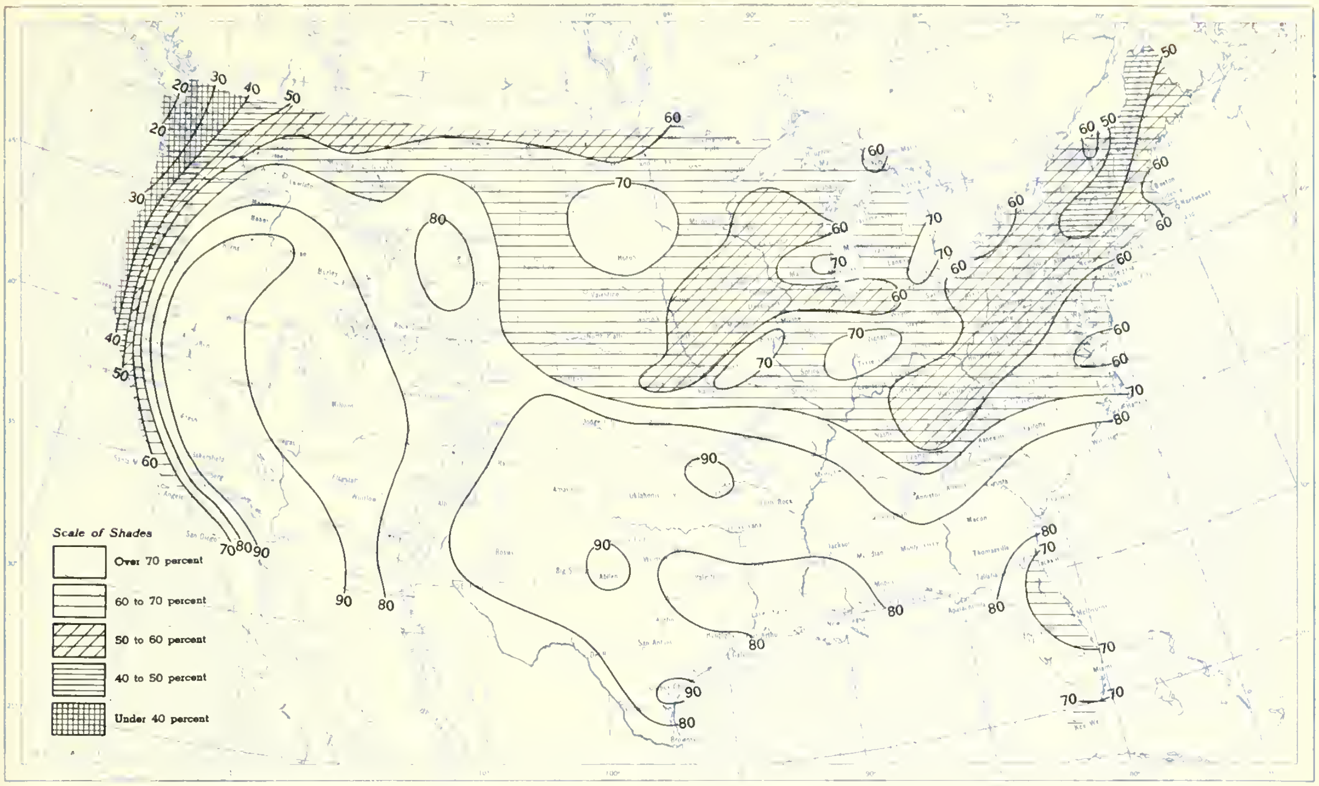


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, August 1954.

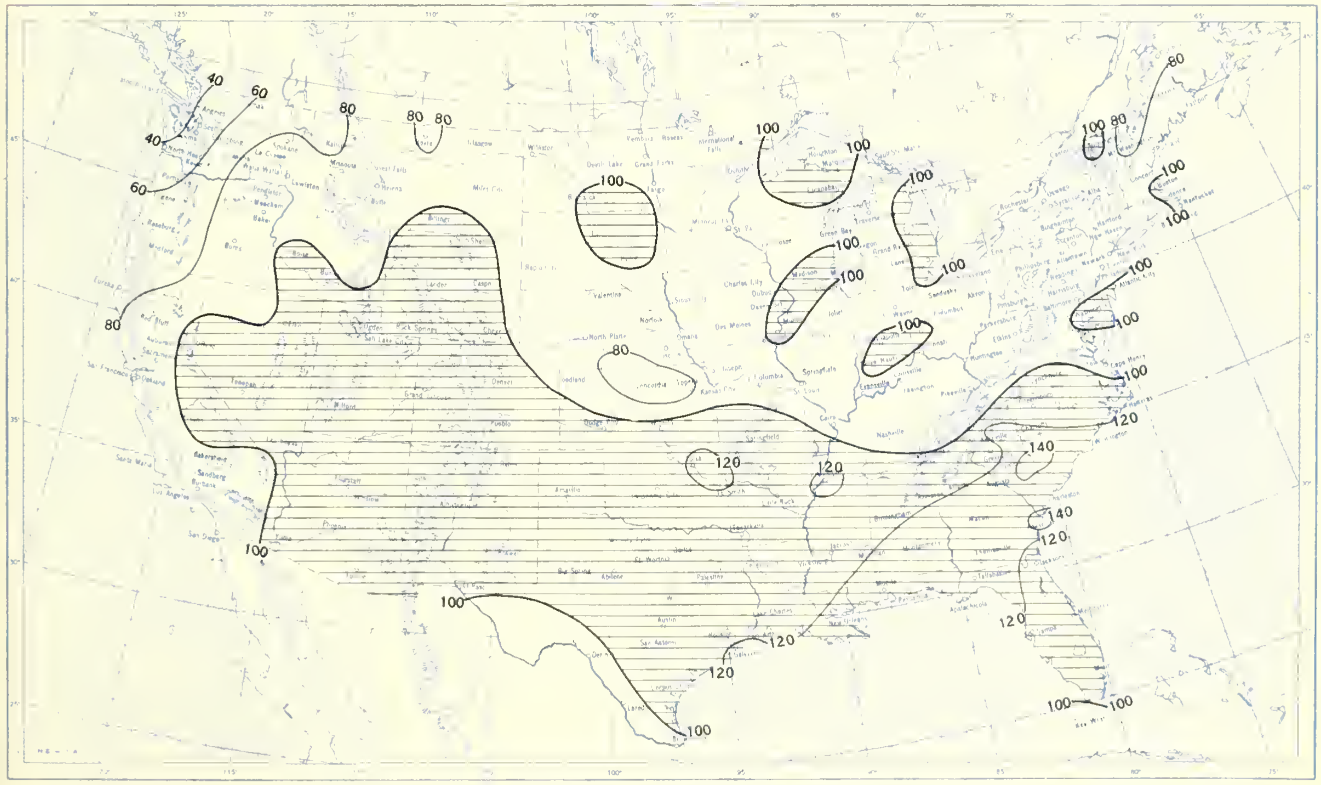


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, August 1954.



B. Percentage of Normal Sunshine, August 1954.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, August 1954. Inset: Percentage of Normal Average Daily Solar Radiation, August 1954.

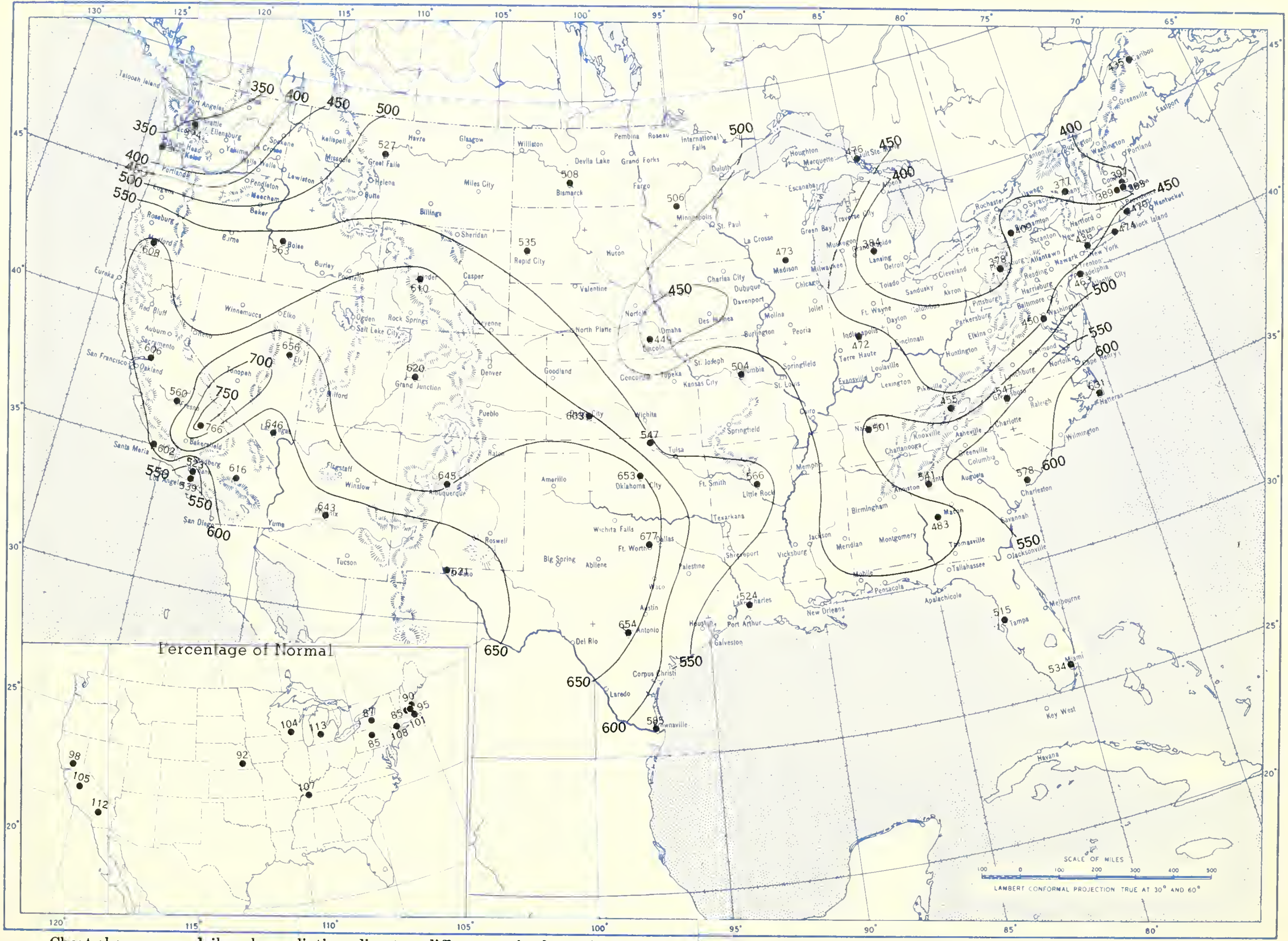
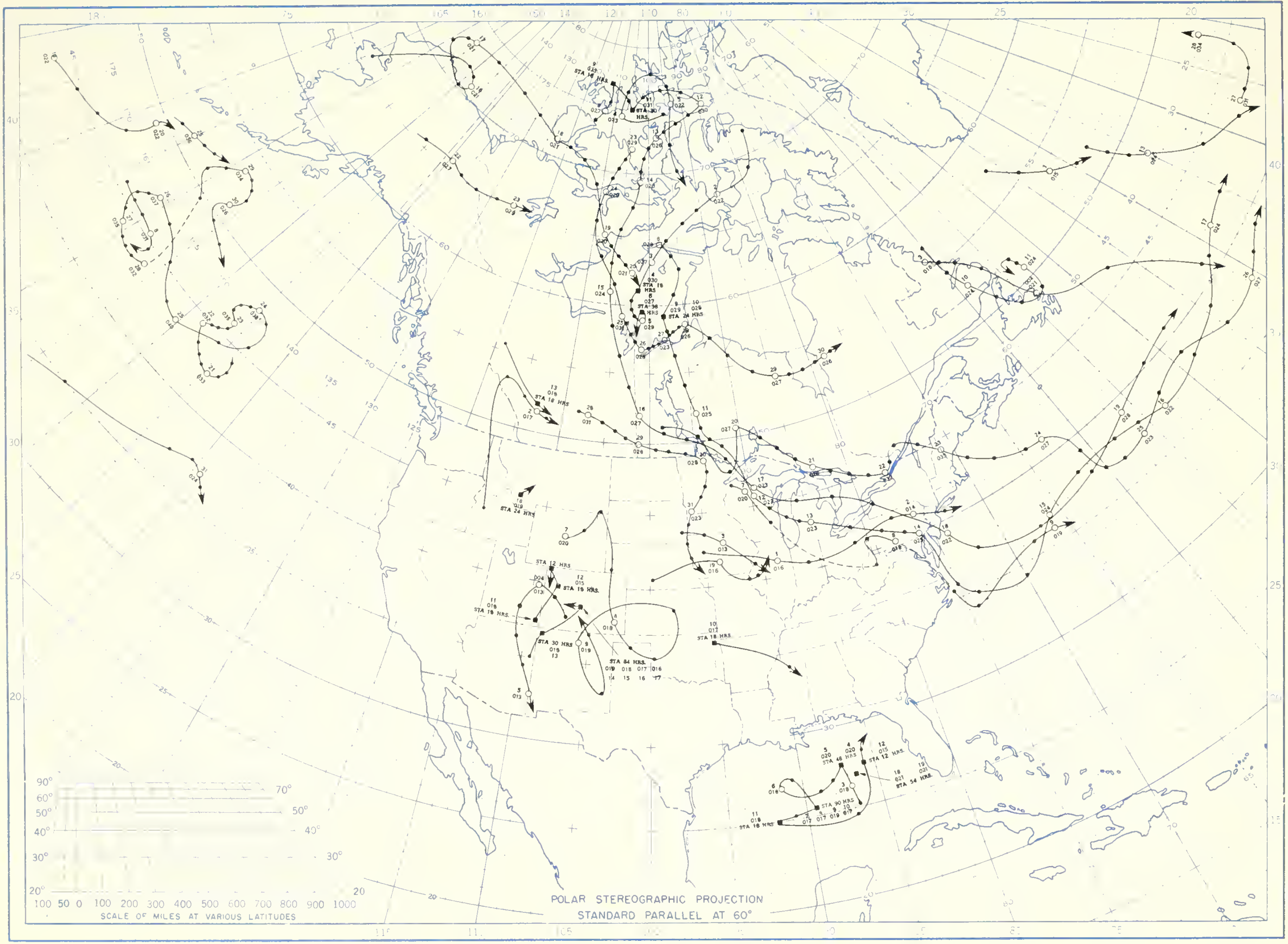


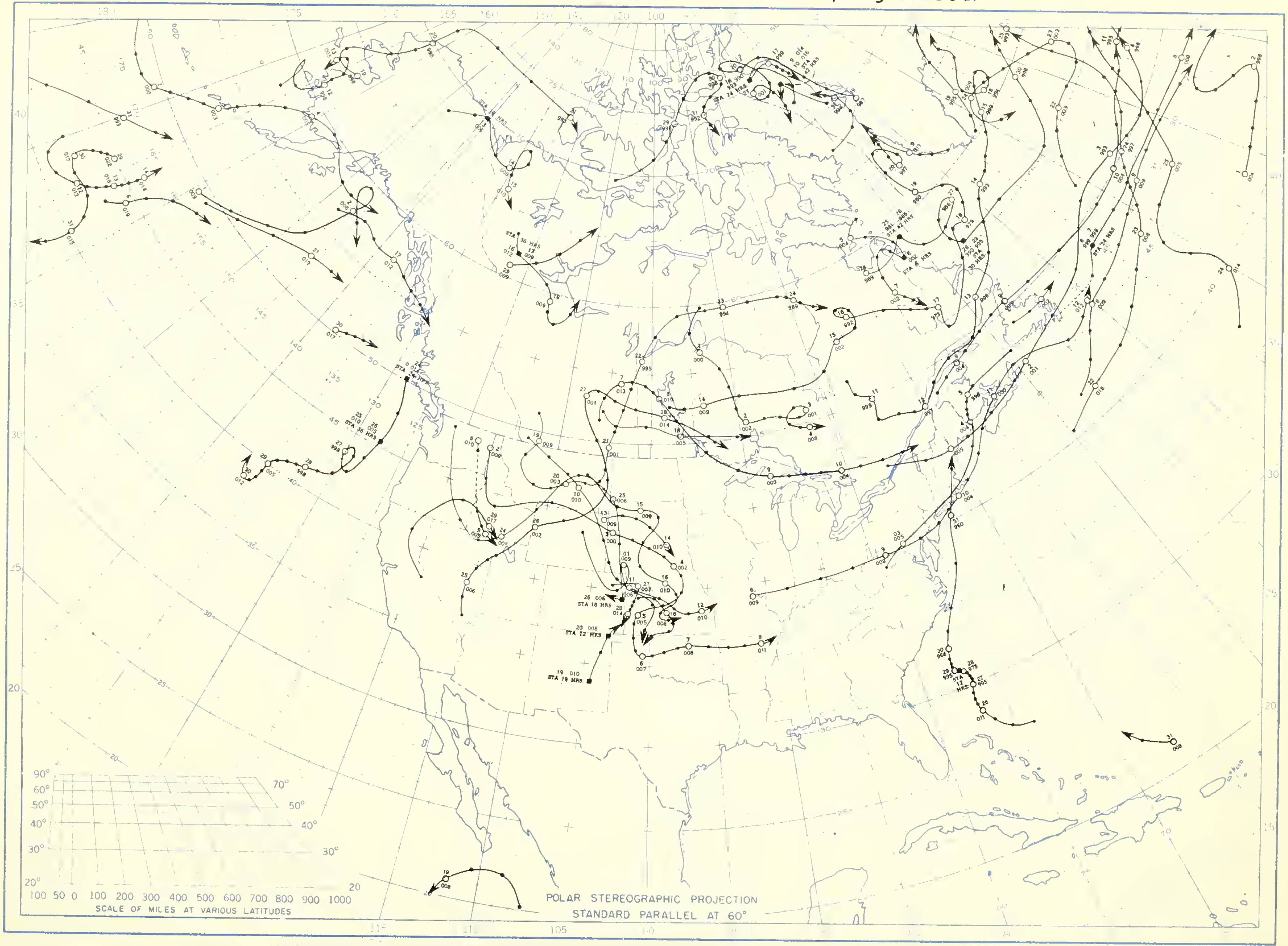
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm.$^{-2}$). Basic data for isolines are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals

Chart IX. Tracks of Centers of Anticyclones at Sea Level, August 1954.



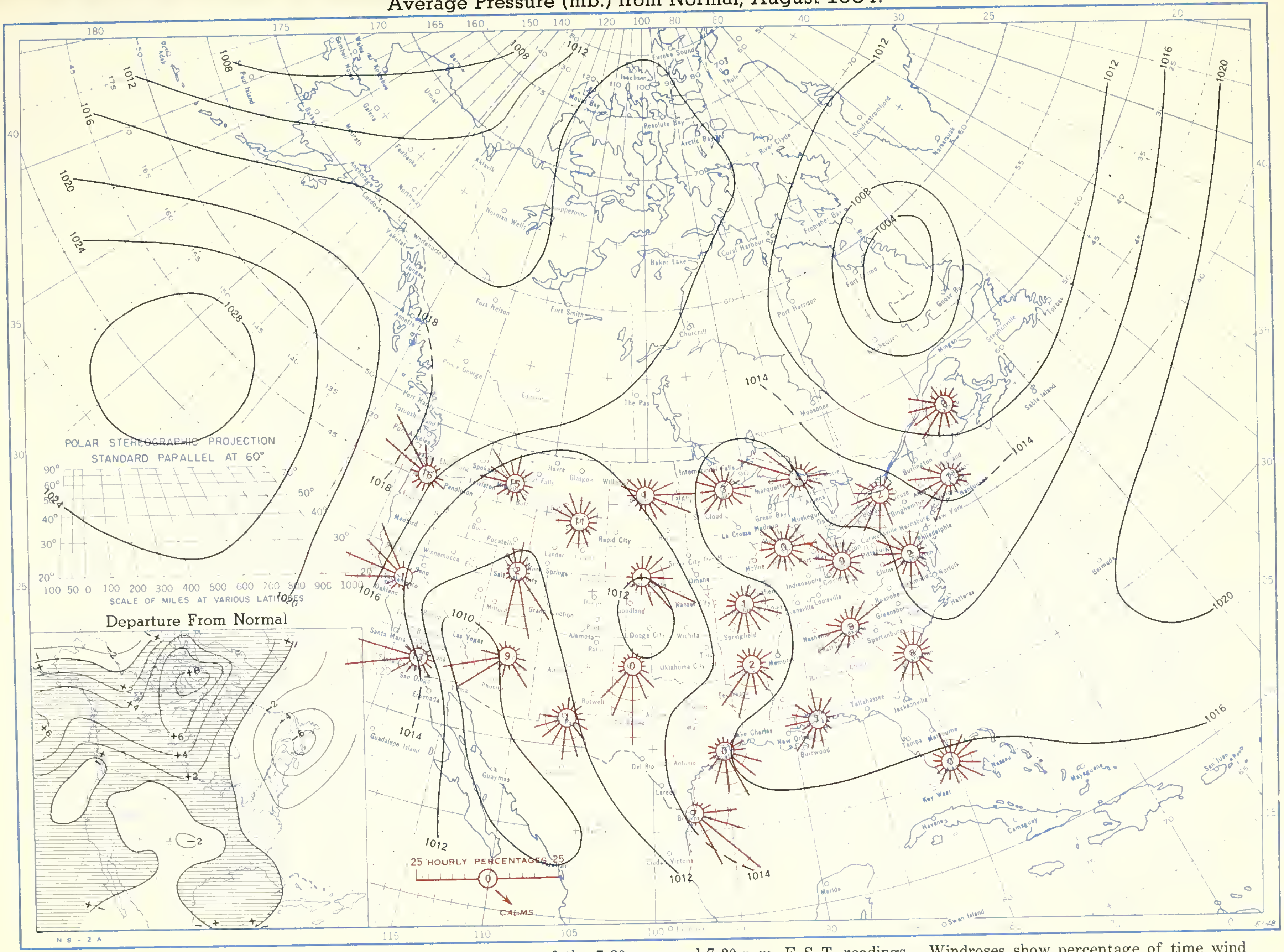
Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

Chart X. Tracks of Centers of Cyclones at Sea Level, August 1954.



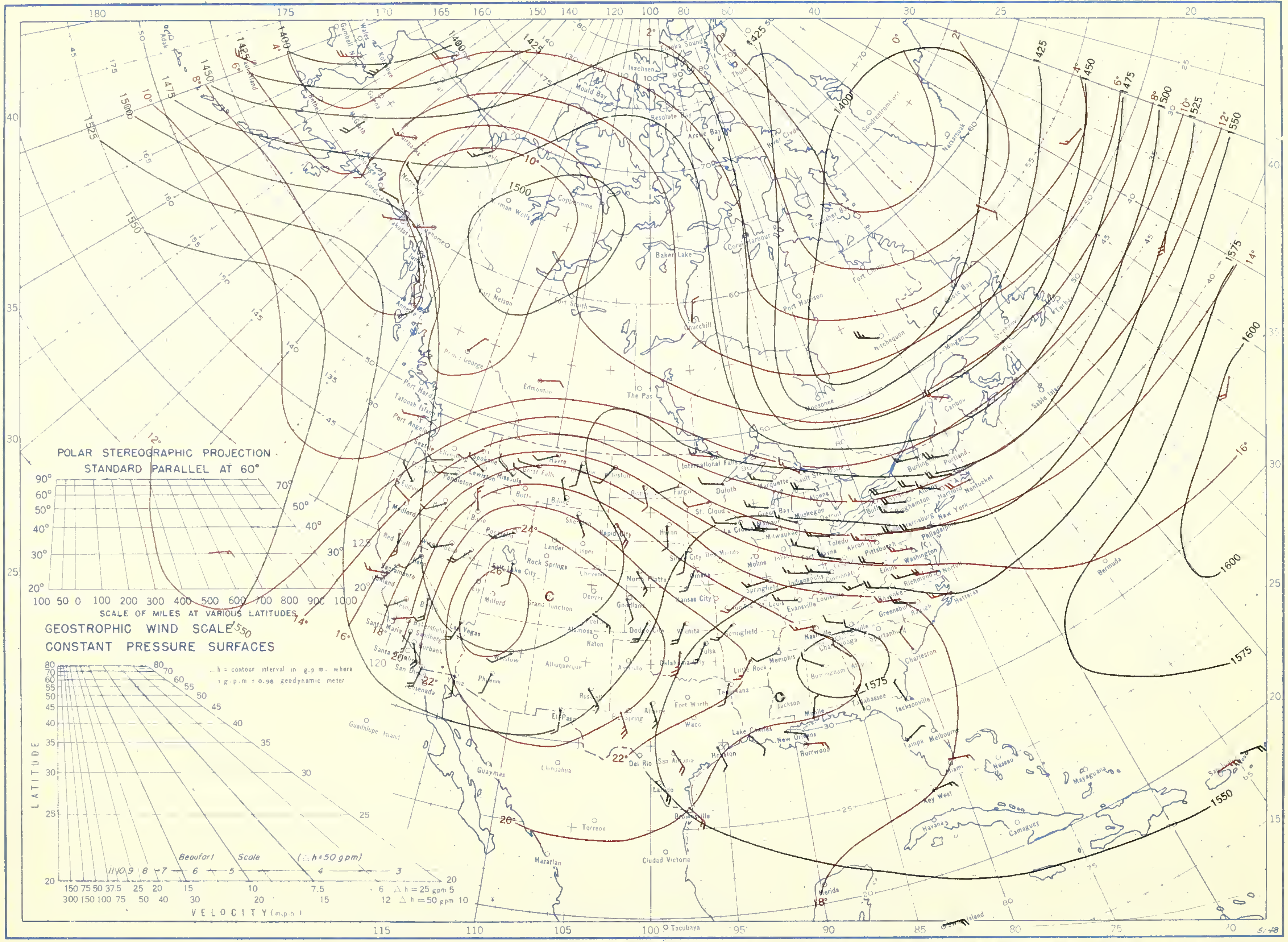
Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, August 1954. Inset: Departure of Average Pressure (mb.) from Normal, August 1954.



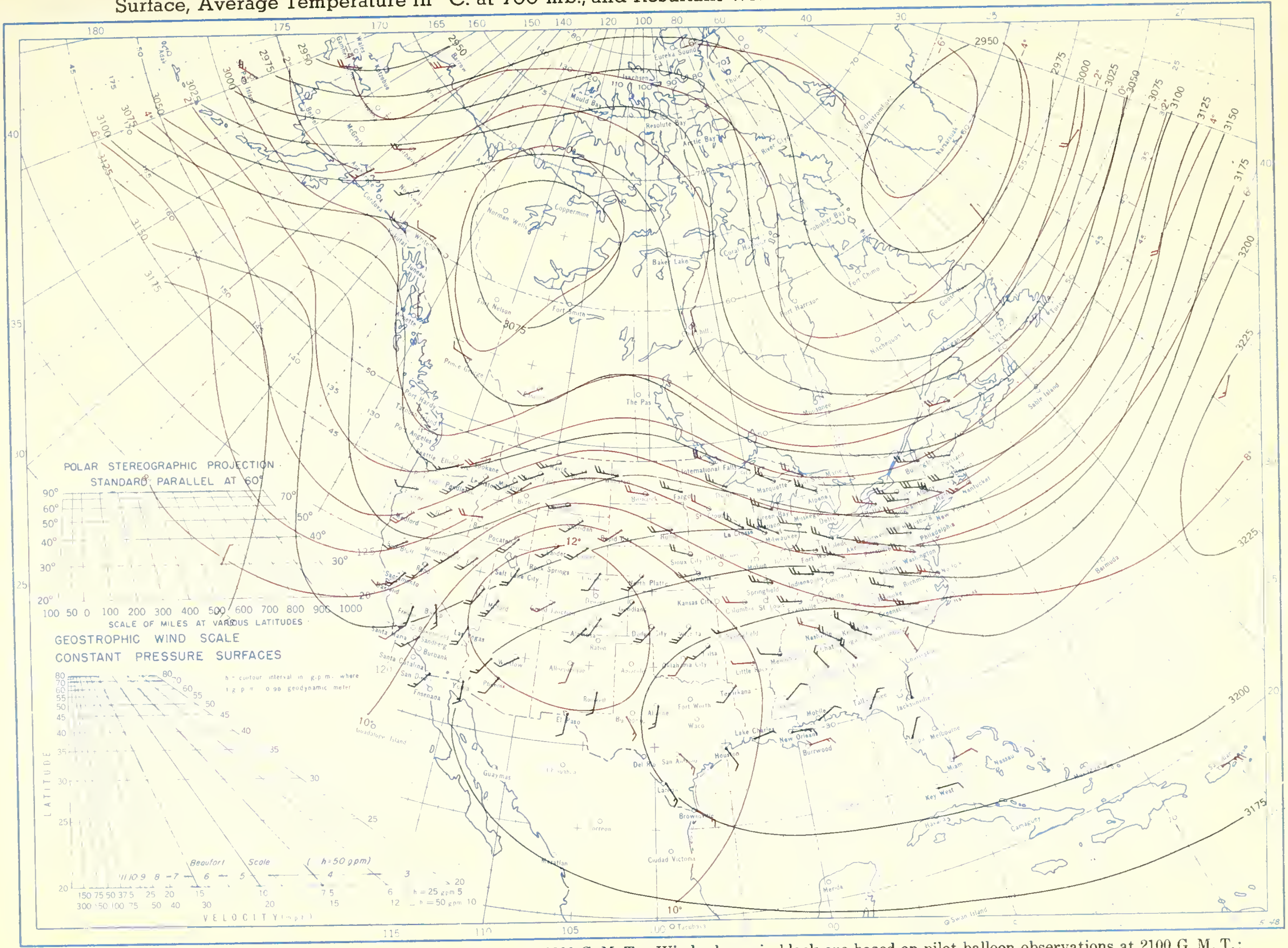
Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), August 1954.



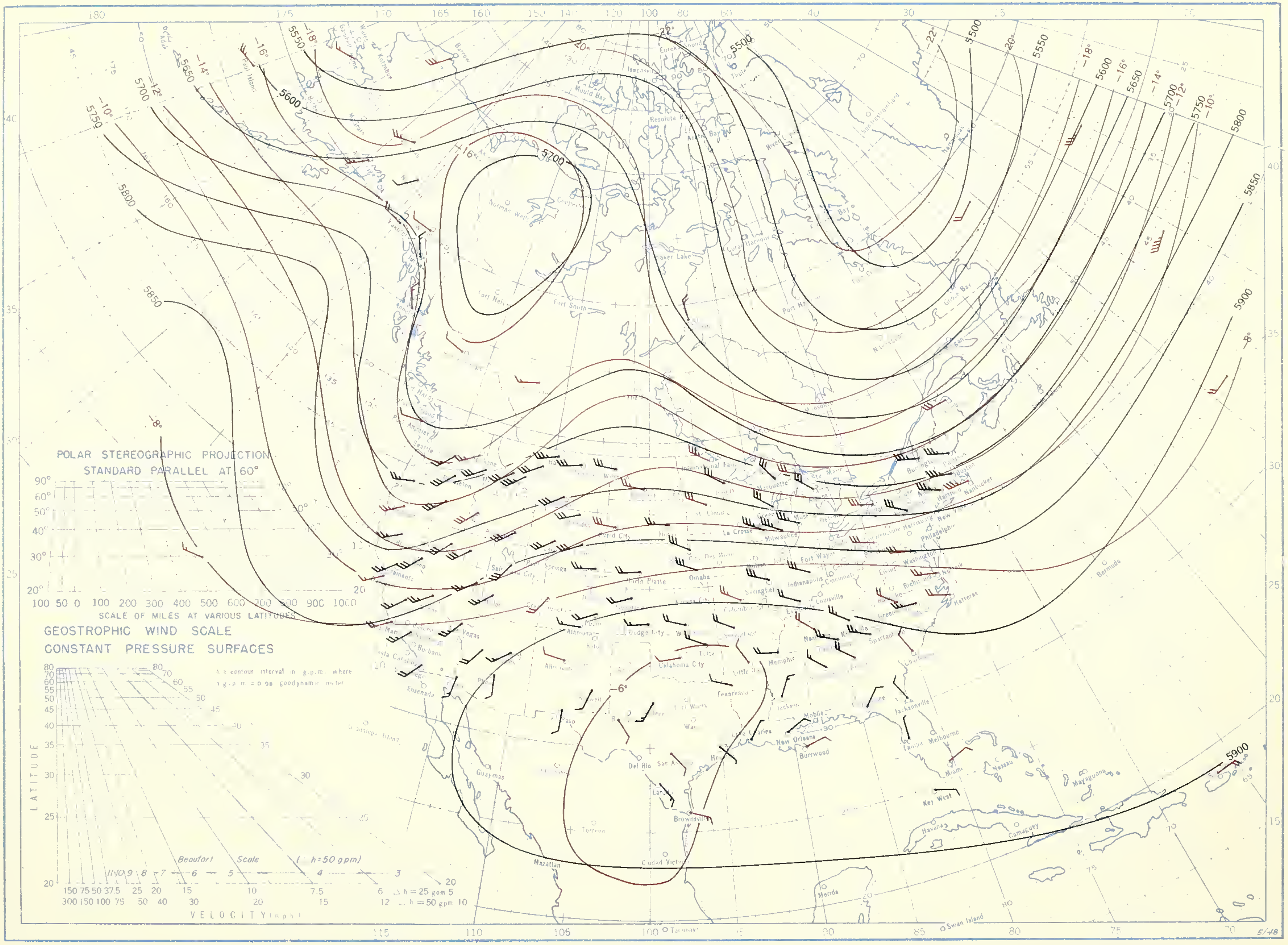
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m.. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), August 1954.



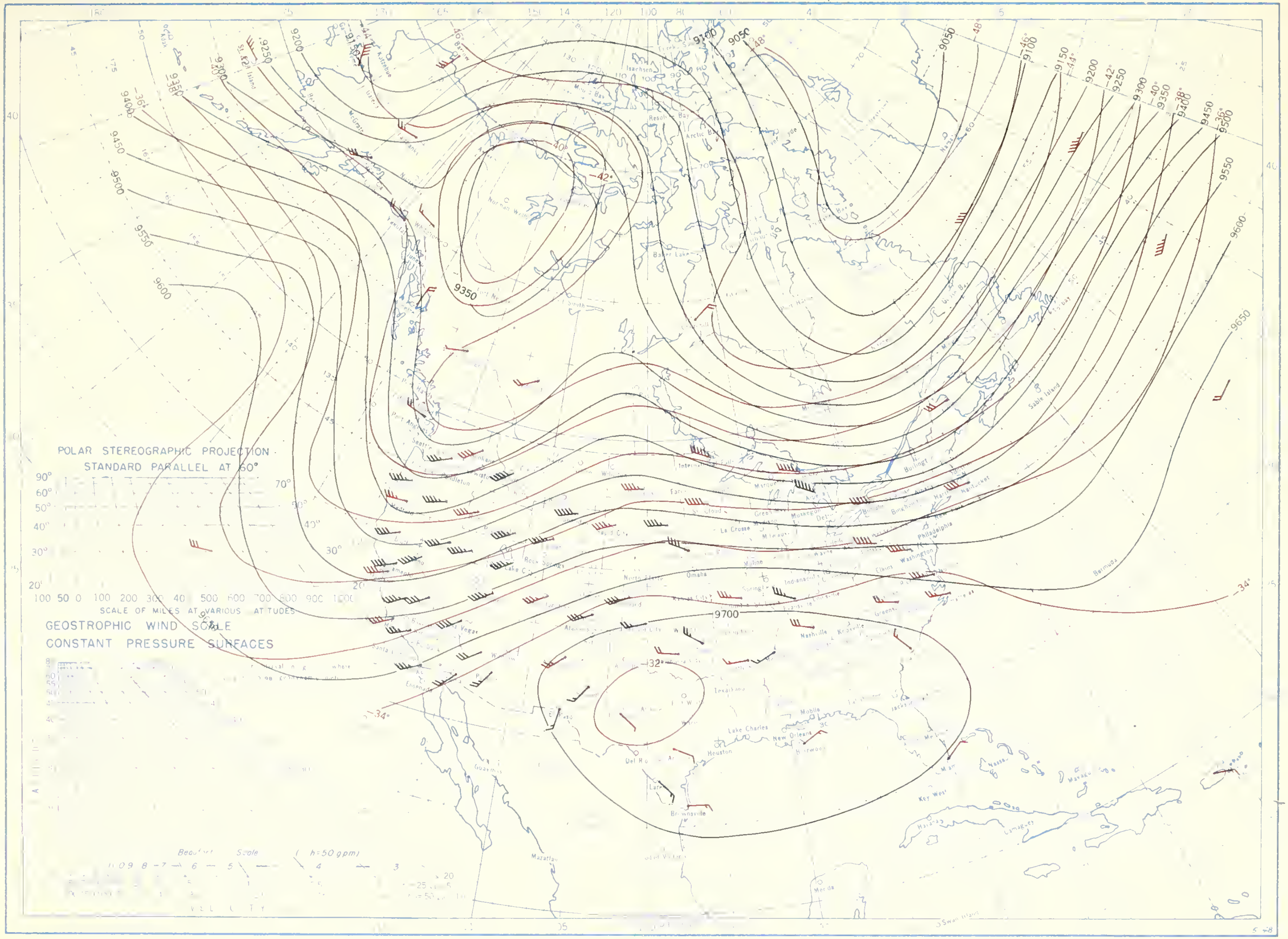
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), August 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 300-mb. Pressure Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), August 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

SEPTEMBER 1954
Volume 5 No. 9

ASHEVILLE: 1954

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CHARTS I-XV

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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CLIMATOLOGICAL DATA
NATIONAL SUMMARY

Volume 5 No. 9 SEPTEMBER 1954

GENERAL SUMMARY OF WEATHER CONDITIONS

The weather during September 1954 behaved in much the same manner as it had behaved throughout most of the summer. In regions near the Canadian Border frequent rainfall and slightly below-normal temperatures were very favorable for pastures and growing crops, which continued in good to excellent condition. The rainy weather, however, adversely affected the spring wheat crop in the North Central Interior by favoring a heavy development of rust during the growing season and delaying the harvest after maturity. Owing to these two factors wheat production in North Dakota was expected to be the lowest since 1938.

Heat and drought continued to plague most of the remainder of the Country east of the Rocky Mountains, although good rains in the Mississippi and Ohio Valleys near the end of the month afforded some relief. In the western portions of the lower Great Plains and in much of the Southeast crops deteriorated, water hauling became necessary to an increasing extent as ponds dried up and wells failed, fall seeding was further delayed, and streamflow in many places was the lowest of record. In South Carolina the prolonged drought was reported to be responsible for the lowest crop production in 50 years.

Following one of the coolest summers on record in the far West, average temperatures for September also averaged below normal. Precipitation was deficient in this region except in the extreme northern portion, and in Arizona, parts of Utah, eastern Nevada, and western Colorado.

Thunderstorms were more frequent than usual in northern areas, particularly in Montana where they occurred on 6 days (a new record) at Billings and on 11 days at Missoula, which has 6 days with these storms on the average.

Sunshine was abundant in most middle and southern sections of the Country, but well below normal along the Canadian Border. Sault Ste. Marie, Mich., had only 26 percent of the possible amount for the month (a new September record).

PRECIPITATION.--The average nationwide precipitation was 1.94 inches, or 0.45 inch below the 62-year mean. The greater portion of the Country received less than the usual September moisture, and about one-third of the total area of the Nation had less than one-half the normal amount. Areas with above-normal amounts were widely scattered, with principal ones including a band along the Canadian Border, most of the Atlantic Coast, parts of the Mississippi and Ohio Valleys, and a large area in the Southwest covering Utah, western Colorado, northern portions of New Mexico and Arizona, and extreme western Nevada.

In the Southeast, most of which has suffered from severe drought since early June, South Carolina, Georgia, and Alabama had only about one-half their normal rainfall for September, and the latter two states had less than 60 percent of normal for the period January through September. In an area including much of these 3 states and extending into northern Mississippi, western North Carolina, and central Virginia the month's rainfall was less than 25 percent of normal and monthly totals in many cases were only a few hundredths of an inch. Many stations in Alabama, Georgia, and northwestern Florida reported the driest January-September period on record. Good examples were Macon, Ga., where rainfall for this period totaled 19.42 inches, a deficiency of 17.65 inches; and Pensacola, Fla., with a total of 23.34 inches which was 26.37 inches less than normal for the period. The drought in Alabama was believed to be as severe as the drought there in 1931 but less severe than the one in 1904.

In the western portion of the Lower Great Plains and most of Texas the scanty rainfall received, only a few hundredths at most, was of little or no benefit as it was soon evaporated by high temperatures, which exceeded 100° on many days.

In the Ohio and central and lower Mississippi Valleys moderate to heavy rains which fell in the latter area on the 19th and 20th and in both areas on the 29th and 30th replenished the topsoil moisture but the subsoil remained dry. Pastures revived and fall grain prospects brightened.

TEMPERATURE.--The average September temperature for the Country as a whole was 67.5°, or 1.5° warmer than usual. The month averaged over 6° above normal in portions of the central Great Plains and over 4° above in most of the area extending from the central Great Plains to the Atlantic Coast. Maximum temperatures in this area reached 100° or more on a few days during the first week and equaled or exceeded 90° during most of the first half of the month and in the Southern States during most of the last decade. The high temperatures during the first week established new records for September at several stations among which were Louisville, Ky., 104° on the 5th and 6th, Greensboro, N.C., 100° and Raleigh, N.C., 104° on the 6th, and Richmond, Va., 103° on the 7th. New heat records of remarkable duration were set in much of the South as a result of the continuation of the unusually high summer temperatures through September. Memphis, Tenn., as an example, at the end of the month had recorded 95° or above on 76 days which exceeded the previous record of 61 days in 1953, 98° or more on 44 days topping the old record of 32 in 1952, 100° or over on 26 days which may be compared to the former record of 16 days in 1952, and finally, the average temperature for the period June through September, 82.7°, was 0.2° higher than the old record established in 1925.

Although temperatures in the far West averaged below normal, monthly departures were generally small, exceeding 3° at only a few stations, and no unusually low temperatures were recorded until the 29th and 30th when a cold air intrusion from western Canada reduced temperatures to the freezing point or lower as far south as northern Arizona. The growing season was ended in most northern interior areas on these dates. At Lewiston, Idaho, frost on the 30th ended a 150-day growing season which was the shortest on record there. Also at Pocatello, Idaho, the frost-free period was the shortest on record, beginning on June 2 and ending with a 31° temperature on September 19.

Highest temperatures for the month occurred in most of the Country during the first week--in the Rocky Mountain area on the 1st and 2d, in the Great Plains on the 2d and 3d, in the Mississippi Valley on the 4th and 5th, and in the East on the 6th and 7th, but about the 10th and 11th on the Gulf Coast, about the 18th and 19th in western Texas and eastern New Mexico, during the last week in California and western Oregon, on the 26th in western North Dakota, on the 22d or 23d in western South Dakota, and on the 11th in western Nebraska, extreme eastern Wyoming, and southeastern Montana. The month's highest temperature was 116° at Cow Creek, Calif., on the 1st.

Lowest temperatures occurred on the 29th and 30th at a few stations in the extreme western portion of the Great Plains and all stations west of the Continental Divide except in central and lower California where they generally occurred during the third week. The lowest temperature of the month, 4°, was recorded at Bondurant, Wyo., on the 29th. In the remainder of the Country monthly minima occurred at nearly all stations during the passage of a cold air mass from the 21st to the 25th, except at some interior stations in New York and New England on the 13th and 15th.

DESTRUCTIVE STORMS.--Hurricane Edna, by far the worst storm of September 1954, was the second hurricane within 11 days to visit the Atlantic Coast. Moving up the Coast on the 11th, its center passed about 100 miles east of Cape Hatteras, N.C., and Cape May, N.J., in the forenoon, crossed Martha's Vineyard and Cape Cod Bay, Mass., in the early afternoon, and reached extreme southeastern Maine about 7:30 p.m. Wind gusts of hurricane force occurred over southern and eastern coastal New England and Long Island, N.Y. Martha's Vineyard and Nantucket, Mass., reported peak gusts of 120 and 110 m.p.h., respectively, and the latter station recorded its lowest pressure of record, 28.17 inches (m.s.l.). On Long Island, Brookhaven National Laboratory reported a peak gust of 95 m.p.h.

Edna was responsible for 21 deaths, 150 injuries, and damage totaling over $40,600,000 in New England, about $2,000,000 in New York, $100,000 in New Jersey, and $115,000 in North Carolina. The greatest damage resulted from washouts and flooding, although wind losses resulting from downed trees and disruption of power and telephone service was also considerable. Heavy rainfall occurred along the Coast from North Carolina to New England, ranging up to more than 8 inches in the latter section.

Numerous severe local storms, other than Edna, resulted in at least 15 deaths, 83 injuries, and estimated losses of property and crops of about $5,500,000. Unestimated losses probably would raise the latter figure to around $6,000,000. Of these local storms the following three were outstanding: (1) hail in Plymouth, Cherokee, and Buena Vista Counties, Iowa, on the 5th damaged corn and soybeans to the extent of $1,650,000. (2) hail in downtown St. Louis, Mo., on the 19th caused $1,000,000 damage, and broken glass was responsible for 20 injuries; on the afternoon of the 20th rain flooded basements where windows were broken by hail the day before causing additional damage of $500,000. (3) on the 2d, thunderstorms with severe lightning and minor squalls caused one injury and damage in excess of $1,000,000 in northern Ohio during the evening of September 2.

CONDENSED CLIMATOLOGICAL SUMMARY

Section	Temperature								Precipitation					
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes			
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least
	°F.	°F.		°F.			°F.		In.	In.		In.		In.
Alabama	78.7	3.2	Florence	106	4	2 Stations	43	12+	1.12	-2.23	Gulf Shores 2SSE	10.74	3 Stations	0.00
Arizona	74.0	1.3	Gila Bend	112	1	do	25	24+	1.46	.07	Mount Lemmon	4.85	do	.00
Arkansas	77.3	3.2	2 Stations	109	3	Bentonville	37	22	2.62	-.70	Eureka Springs	6.17	Marianna	.31
California	68.8	-.9	Cow Creek	116	1	Boca	14	18+	.16	-.19	Cuyamaca	3.25	288 Stations	.00
Colorado	61.3	2.9	Eversoll Ranch	101	18	Fraser	8	21	1.58	.19	Cascade	5.10	4 Stations	.00
Connecticut	60.8	-1.8	Kent	87	5	Falls Village	31	13+	8.02	4.13	New London	11.21	Bridgeport WB AP	5.08
Delaware	69.1	.6	Middletown 2S	95	6+	2 Stations	40	24	4.09	.67	Milford	6.25	Middletown 2S	2.34
Florida	80.8	1.4	4 Stations	102	1+	Milton Exp. Sta.	56	3	6.62	-.25	Fort Lauderdale Bahia M.	18.28	Chattahoochee	.88
Georgia	78.3	2.6	Cartersville	106	6	Blairsville Exp. Sta.	39	23+	1.94	-1.93	Blackbeard Island	18.14	3 Stations	.00
Idaho	57.7	.4	Grand View	100	10	Three Creek	8	30	.54	-.45	Burke 2NNE	3.44	12 Stations	.00
Illinois	70.8	3.1	2 Stations	107	4+	5 Stations	34	23	2.03	-1.61	Centralia 4W	10.06	2 Stations	.11
Indiana	69.5	2.2	4 Stations	106	5+	4 Stations	31	23	1.74	-1.54	Washington	5.40	Crawfordsville Pwr Pl	T
Iowa	66.3	2.0	2 Stations	100	4	2 Stations	28	22	2.19	-1.82	Oakland 2E	5.77	Bloomfield 2N	.52
Kansas	75.2	5.2	4 Stations	108	2+	do	34	22+	1.42	-1.51	Chanute CAA AP	5.70	2 Stations	.00
Kentucky	72.7	2.5	2 Stations	108	5	Clermont 1SSE	39	23	3.96	1.05	Bicksville	8.47	Oneonta Dam 35	1.34
Louisiana	79.3	1.2	Winnfield	106	3	Logansport	40	23	2.87	-.90	Port Sulphur	11.90	Spearsville	.10
Maine	55.7	-2.1	Fort Kent	85	2	Presque Isle	31	15	8.51	4.88	Winslow	11.97	Eastport	3.90
Maryland	69.9	2.4	2 Stations	102	7	Oakland 1SE	31	24	1.87	-1.51	Salisbury	5.27	Cheltenham 1NW	.48
Massachusetts	60.0	-2.1	Lawrence	86	5	Walpole 1S	30	24	7.86	4.15	Lake Cochituate	15.02	Provincetown 3N	4.33
Michigan	59.8	-.2	Wayne	104	5	Cadillac CAA AP	24	23	3.98	.68	Onaway 12S	8.22	Grand Ledge	1.27
Minnesota	57.2	-1.3	Canby	92	1	Detroit Lakes 1NE	25	22	3.27	.45	Winona	5.71	Angus 4NNE	.88
Mississippi	78.6	2.8	6 Stations	105	4+	Newton Exp. Sta.	42	23	2.13	-.95	Pearlington	10.63	Macon 2NE	.08
Missouri	73.7	4.4	Vandalia	108	5	2 Stations	33	22+	2.47	-1.53	Galena	6.40	Gallatin 2NE	.17
Montana	55.1	-.9	Plevna	98	1	Dell 19SW	12	30	1.62	.34	Medicine Lake 3SE	5.27	2 Stations	.05
Nebraska	68.0	3.7	Cambridge	106	1	Merriman	24	21	1.41	-.69	Spencer 5SE	4.30	Ragan	.05
Nevada	62.5	-.3	2 Stations	112	1	Deeth	10	29	.32	-.10	North Las Vegas Dox	1.58	29 Stations	.00
New Hampshire	56.4	-2.0	West Lebanon	86	6	Fabyan	28	13	7.84	4.10	York Pond	13.55	Lebanon CAA AP	4.88
New Jersey	66.0	.1	Elizabeth	94	7	Layton 3NW	32	24	5.66	1.96	Paterson	9.96	Deepwater	1.99
New Mexico	68.0	2.4	Jal	102	20	Eagle Nest	18	20	1.35	-.48	Dilia	6.16	3 Stations	.00
New York	59.8	-1.0	2 Stations	97	5	Speculator	22	24	3.84	.36	Valhalla 2E	10.19	Hammondsport	.64
North Carolina	73.8	2.2	Weldon	109	7	Mortimer	27	23	1.66	-2.42	Lola	12.60	2 Stations	.00
North Dakota	55.4	-1.7	Forman	93	26	Medora 4NNE	18	21	3.04	1.51	Parshall	6.56	Bowman 11SE	.16
Ohio	67.9	2.3	Milford	105	6	Mansfield 6W	30	23	1.55	-1.35	Ironton	4.61	Lakeview	.08
Oklahoma	79.5	5.3	7 Stations	107	3+	Tahlequah	38	22	.97	-2.18	Bee Mt. Tower	7.34	3 Stations	.00
Oregon	57.1	-1.6	Rome	98	1	2 Stations	5	30	.95	-.24	Quartsville 1SW	4.19	2 Stations	.00
Pennsylvania	64.5	.5	Farrell Sharon	102	5	Donegal	27	24	2.70	-.68	George School	5.84	Pine Grove 1NE	1.01
Rhode Island	61.3	-2.0	2 Stations	82	6	Kingston	35	24	7.05	3.70	Austin	11.12	Providence WB AP	6.04
South Carolina	77.3	2.7	Little Mountain	106	6	Chester 2SW	41	24	1.63	-2.51	Walterboro	7.76	3 Stations	.00
South Dakota	61.7	.1	Ardmore	98	11	Ralph	15	21	1.51	-.04	Arlington	4.95	Camp Crook	T
Tennessee	74.6	3.2	Dickson	108	5	Crossville Exp Sta.	37	22	2.48	-.68	Lebanon	5.66	Duck Town	.09
Texas	79.9	3.6	Boquillas Ranger Sta.	110	20	Warren	40	23	1.01	-1.88	El Campo	7.35	Several Stations	.00
Utah	62.3	1.5	4 Stations	102	1	Woodruff	14	30	1.60	.56	Birdseye	4.13	Lucin AP	.07
Vermont	58.1	-2.0	Dorset 1S	86	5	West Burke	28	13+	5.62	1.90	Canaan	8.72	Cornwall 1N	3.31
Virginia	71.3	2.8	Charlottesville 2W	107	7	Burkes Garden	33	24	1.48	-1.76	Chsritan	4.41	Elkwood	.17
Washington	58.2	-.7	Richland	94	10	2 Stations	22	30	1.60	-.04	Quinault RS	5.16	White Swan	.00
West Virginia	67.5	1.4	Williamson	104	7	do	26	24	2.72	-.27	Fink Run	4.84	Franklin 3NE	.70
Wisconsin	59.0	-.9	5 Stations	96	5+	Long Lake Dam	20	23	5.30	1.58	Waupaca	8.86	Lake Geneva	1.48
Wyoming	57.9	2.7	Sheridan Field Sta.	104	1	Bondurant	4	29	.84	-.56	Tennyson	4.45	4 Stations	.00
Puerto Rico	78.1	-.5	Dos Bocas Dam	100	8	Guineo Resevoir (2)	58	18	12.40	5.65	Toro Negro #2	32.12	Vieques Island	3.65

+ And also on a later date or dates.

Note: Dates in Table 1 apply to the period 24 hours prior to time of observation. In some cases the actual occurrence is on the calendar date preceding that shown. (See individual Climatological Data for times of observations).

CLIMATOLOGICAL DATA

Table 2 SEPTEMBER 1954

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
ALABAMA																																
Birmingham	610	991.5	1016.6	92	65	78.4	3.6	100	6+	49	22	21	0	59	58	1.24	-1.47	1.03	2	3	0.0	0	6.3	SE	30	N	21	17	7	6	3.7	79
Mobile	211	1008.1	1016.2	92	70	81.2	3.5	98	10+	62	23	25	0	68	73	4.29	-1.49	2.88	6	6	.0	0	8.9	E	--	---	--	15	12	3	3.8	--
Montgomery CO	201	------	------	92	69	80.7	3.1	99	10+	59	23	25	0	--	--	.92	-2.09	.38	5	3	.0	0	----	---	--	---	--	--	--	--	---	--
Montgomery	198	1008.8	1016.1	94	67	80.5	3.4	100	10+	57	23	26	0	62	61	.44	-3.07	.27	5	2	.0	0	6.1	NE	30	E	9	16	10	4	3.7	85
ARIZONA																																
Flagstaff	6993	------	------	74	42	57.8	.8	81	21	30	30	0	2	--	--	3.14	1.29	1.35	5	6	T	T	----	---	--	---	--	18	8	4	3.3	--
Phoenix	1114	970.2	1008.3	99	73	86.2	3.5	105	9+	65	30	30	0	59	43	.44	-.56	.32	3	5	.0	0	5.3	SE	*35	S	1+	24	4	2	1.7	97
Prescott	5014	847.3	1011.6	84	54	69.1	.9	92	21	45	26	2	0	--	--	1.79	-.37	.77	5	8	.0	0	6.5	SSW	36	SE	11	21	8	1	2.6	84
Tucson	2558	922.8	1008.8	96	70	82.9	2.8	105	21	61	30	26	0	51	39	3.05	1.57	1.29	6	6	.0	0	6.4	ESE	43	N	1	20	7	3	2.7	89
Winslow	4880	851.7	1010.5	87	55	71.0	2.4	92	1+	46	21+	12	0	45	47	1.45	.33	.68	8	9	T	T	7.9	SE	*27	SSW	11+	20	9	1	2.7	--
Yuma	199	1002.0	1007.0	104	74	88.9	.6	110	21	63	30	30	0	54	36	T	-.64	T	0	1	.0	0	8.3	S	34	S	22	26	3	1	1.3	95
ARKANSAS																																
Fort Smith	458	998.3	1014.8	94	63	78.6	3.6	105	3	45	22	23	0	54	49	2.12	-1.59	2.08	3	4	.0	0	7.2	NE	41	SW	29	17	6	7	3.1	84
Little Rock	257	1002.7	1015.5	92	65	78.7	3.9	103	4	54	24	22	0	58	55	1.78	-1.07	1.25	6	3	.0	0	7.6	SW	30	SW	30	16	9	5	3.3	82
Texarkana	361	------	------	94	66	79.8	2.6	101	3	52	23+	22	0	--	--	1.56	-1.23	2.24	5	5	---	--	----	---	--	---	--	--	--	--	---	--
CALIFORNIA																																
Bakersfield	489	994.2	1013.9	90	59	74.3	-1.3	100	25	53	16+	15	0	47	41	.00	-.07	.00	0	0	.0	0	5.2	WNW	*18	NW	3+	27	2	1	.8	--
Bishop	4108	871.7	1010.5	89	43	65.8	-1.5	94	3+	32	30	16	1	--	--	.14	-.05	.14	1	1	.0	0	---	---	--	---	--	26	2	2	1.4	--
Blue Canyon	5280	839.1	1012.2	70	50	60.1	-3.4	81	1	37	15	0	0	--	--	.62	.06	.62	1	1	.3	T	---	---	--	---	--	27	3	0	1.2	--
Burbank	699	985.4	1011.6	87	57	72.2	1.0	98	25	51	14	11	0	52	57	T	-.29	T	0	0	.0	0	5.0	S	*15	ESE	24	23	6	1	1.9	--
Eureka CO	43	1013.5	1015.9	63	52	57.5	1.3	76	25	44	29	0	0	--	--	.87	.20	.44	6	0	.0	0	5.8	---	24	N	29	11	9	10	5.0	55
Fresno	331	999.7	1011.4	88	55	71.2	-2.3	97	25	48	23	13	0	47	47	.00	-.05	.00	0	0	.0	0	5.4	NW	19	NW	14	26	3	1	1.0	98
Los Angeles CO	312	------	------	84	61	72.5	1.5	94	25	55	14	4	0	57	66	T	-.27	T	0	0	.0	0	5.0	---	17	E	1+	23	5	2	2.0	85
Los Angeles	99	1007.8	1011.6	76	60	67.8	1.1	87	1	53	20	0	0	59	76	T	-.21	T	0	0	.0	0	5.7	W	%22	W	6	17	11	2	3.1	--
Mt. Shasta	3543	892.0	1015.0	74	40	57.1	-2.7	89	25	29	29	0	3	--	--	.13	-.63	.10	2	0	.0	0	----	---	--	---	--	25	5	0	1.3	--
Oakland	3	1013.9	1014.0	73	55	64.0	.7	93	25	50	18+	2	0	52	72	.01	-.08	.01	1	0	.0	0	6.8	W	*25	W	11	20	9	1	2.6	--
Red Bluff	341	999.7	1012.1	87	56	71.9	-3.1	99	25+	46	30	10	0	41	39	.15	-.18	.15	1	1	.0	0	7.4	NNW	33	SE	10	27	3	0	.8	97
Sacramento	17	1010.8	1011.9	84	53	68.7	-1.6	96	26	47	18	8	0	48	54	.00	-.06	.00	0	0	.0	0	7.7	SSW	31	SW	14	29	1	0	.5	98
Sandberg CO	4517	862.2	1011.2	79	57	67.9	-1.5	88	21	44	15	0	0	--	--	T	-.23	T	0	0	.0	0	----	---	--	---	--	27	2	1	.9	--
San Diego	19	1007.8	1011.1	77	62	69.3	.6	87	1	55	21	0	0	60	74	.00	-.17	.00	0	0	.0	0	5.7	NW	16	NW	17	24	6	0	2.4	78
San Francisco CO	52	------	------	69	55	61.8	.2	93	25	51	30	2	0	--	--	T	-.13	T	0	0	.0	0	9.5	---	26	W	7	19	9	2	2.6	81
San Francisco	1	1012.9	1013.7	72	51	61.9	-.1	91	24	45	5	2	0	53	78	T	-.11	T	0	0	.0	0	13.3	W	38	WNW	7	20	9	1	2.3	--
Santa Maria	231	1004.4	1013.1	74	49	61.1	-1.0	90	23	41	20	1	0	51	75	T	-.12	T	0	0	.0	0	6.2	W	*27	NNE	23	21	8	1	2.5	--
COLORADO																																
Alamosa	7534	775.1	1018.2	76	38	57.0	2.3	84	1+	24	19	0	6	--	--	.88	.19	.51	6	6	.0	0	----	---	--	---	--	13	12	5	4.0	--
Colorado Springs	6173	812.1	1013.0	80	50	64.8	2.8	90	1+	39	30	3	0	37	43	1.91	.84	1.20	6	5	T	T	9.5	NNW	*35	SW	4	19	7	4	3.1	--
Denver	5292	838.5	1012.6	80	52	65.7	3.0	89	2	37	29	0	0	38	43	.77	-.31	.28	9	8	.0	0	9.0	S	34	NW	8	12	14	4	4.1	76
Grand Junction	4849	859.5	1013.1	79	55	67.1	-.2	96	1	46	20	2	0	43	48	2.51	1.49	.56	9	13	.0	0	9.6	ESE	40	SW	2	15	9	6	4.1	70
Pueblo	4639	856.4	1011.9	86	54	69.8	5.0	96	1+	43	21	12	0	42	40	.02	-.73	.02	1	2	.0	0	6.9	SE	43	W	15	21	5	4	2.9	77
CONNECTICUT																																
Bridgeport	7	1015.9	------	73	57	64.6	-.6	83	6	43	24	0	0	--	--	5.08	1.53	3.50	11	3	.0	0	----	---	--	---	--	9	8	13	6.1	--
Hartford	169	------	1016.0	70	52	61.2	---	83	6	40	13	0	0	53	79	5.13	----	3.23	14	3	.0	0	9.9	SW	52	N	11	8	8	14	6.4	51
New Haven	6	1011.9	1015.9	71	54	62.6	-1.0	82	6	44	25+	0	0	--	--	7.98	4.52	5.55	14	3	.0	0	6.8	---	33	NW	11	9	7	14	6.2	58
DELAWARE																																
Wilmington	73	1013.2	1016.4	78	58	68.3	.3	94	6	45	23	3	0	59	76	3.39	-.41	3.39	10	5	.0	0	7.3	NW	--	---	--	12	9	9	5.1	--
DIST. OF COLUMBIA																																
Washington CO	72	------	------	84	63	73.5	3.6	100	7+	49	24	7	0	--	--	.83	-3.53	.34	9	3	.0	0	----	---	36	W	19	--	--	--	---	--
Wash. Nat'l AP	14	1012.5	1016.8	84	63	73.3	3.7	99	7	50	24	6	0	60	67	.63	-3.49	.22	8	3	.0	0	8.3	SSW	42	NW	19	15	6	9	4.2	74
FLORIDA																																
Apalachicola	13	1013.5	1014.6	86	74	80.0	1.1	92	11+	71	24	3	0	--	--	6.20	-1.45	3.32	15	13	.0	0	7.8	---	30	E	24	12	8	10	4.8	70
Daytona Beach	31	1014.2	1015.8	89	72	80.5	1.1	95	11+	68	19	8	0	72	82	1.88	-4.64	.54	15	6	.0	0	9.7	ENE	*25	NNW	9	5	13	12	6.4	--
Fort Myers	15	1014.2	1014.6	90	73	81.8	.5	93	17+	70	26+	23	0	74	84	10.31	1.72	2.90	16	14	.0	0	7.5	E	*26	WSW	26	6	11	13	6.4	--
Jacksonville CO	18	------	------	88	73	80.4	1.3	96	10	68	12	11	0	--	--	8.48	1.69	4.37	20	--	---	--	----	---	--	---	--	--	--	--	---	--
Jacksonville	24	1015.2	1016.2	89	72	80.2	1.0	96	10	65	12	14	0	72	82	8.73	1.77	3.35	17	7	.0	0	8.8	ENE	46	S	11	5	15	10	6.1	47
Key West CO	9	1012.5	1013.2	90	76	82.9	.2	92	10+	70	22	20	0	--	--	5.75	-.30	.98	15	10	.0	0	7.6	---	27	E	14	4	12	14	6.9	57
Lakeland CO	214	------	------	89	73	80.9	.8	93	10	70	27+	12	0	--	--	3.92	-2.45	.86	20	17	.0	0	5.9	---	--	---	--	2	14	14	6.9	53
Miami CO	8	------	------	86	76	80.8	-.2	92	10	70	1	2	0	--	--	5.23	-1.49	1.34	18	8	.0	0	11.8	---	37	SE	15	5	15	10	6.3	75
Miami	8	1011.9	1014.0	89	76	82.4	.7	95	10	73	28+	10	0	74	78	8.28	-.05	2.16	20	12	.0	0	8.2	SE	*28	SSE	13	3	15	12	6.5	--
Miami Beach	9	------	------	86	78	82.1	.2	94	9	73	14+	3	0	--	--	4.86	-.99	1.42	18	--	.0	0	----	---	--	---	--	6	5	19	---	--
Orlando	106	1011.2	1015.5	90	72	80.9	.2	95	11+	70	27	16	0	73	84	3.99	-3.16	.88	17	9	.0	0	7.6	NE	*25	NE	19	4	13	13	6.2	--
Pensacola CO	13	1012.5	------	88	74	80.9	2.6	95	11	67	12+	11	0	--	--	2.60	-3.18	1.43	6	4	.0	0	----	---	26	E	10	--	--	--	---	80
Pensacola CAA AP	118	------	1015.3	--	--	----	---	---	--	--	--	--	--	70	73	----	----	----	--	--	---	--	8.3	NE	--	---	--	--	--	--	---	--
Tallahassee	64	1012.9	------	91	71	80.9	2.9	98	11+	69	24+	18	0	70	78	2.82	-2.54	1.01	12	9	.0	0	4.7	ENE	--	---	--	7	13	10	5.5	--
Tampa	19	1013.9	1015.1	89	73	81.0	.5	92	18+	69	13	14	0	73	83	6.35	-.10	1.57	15	15	.0	0	7.2	E	*28	NE	5	7	11	12	6.2	72
West Palm Beach	15	1013.2	1014.1	89	75	81.8	.6	94	10	70	14	14	0	74	82	11.00	1.88	2.87	19	10	.0	0	10.8	ESE	*50	SSE	14	4	12	14	6.7	--
GEORGIA																																
Atlanta	977	975.3	1017.5	89	66	77.8	3.4	98	19+	55	22	13	0	59	59	.26	-2.70	.12	4	2	.0	0	6.8	E	32	NW	10	15	10	5	4.0	79
Athens	798	990.2	------	90	64	77.2	2.0	99	5+	53	24+	16	0	--	--	.52	-2.54	.26	4	4	.0	0	----	---	--	---	--	15	11	4	3.7	--
Augusta	143	1010.2	1016.7	91	64	77.3	.3	98	6	49	24	18	0	66	73	.78	-2.43	.78	2	0	.0	0	5.2	NE	*22	WSW	20	18	4	8	4.0	--
Columbus	385	1002.4	1016.3	92	66	78.9	2.7	98	6+	58	23+	22	0	--	--	.45	-1.91	.26	5	1	.0	0	----	---	--	---	--	15	10	5	3.8	--
Macon	356	1002.7	1016.0	93	68	80.4	2.9	100	8+	55	24	21	0	63	62	1.85	-1.07	1.51	4	0	.0	0	4.1	ENE	33	SW	10	17	9	4	3.7	84
Rome	637	994.2	1016.9	91	59	75.3	1.1	101	5+	48	23	18	0	--	--	.97	-2.01	.60	3	5	.0	0	----	---	--	---	--	14	9	7	4.2	--
Savannah	48	1014.2	1016.6	88	67	77.8	.5	96	11	59	3	12	0	68	77	6.56	.06	5.87	6	4	.0	0	7.9	NNE	31	SW	11	9	13	8	5.5	71
IDAHO																																
Boise	2842	918.7	1013.1	77	46	61.6	-.8	95	10	27	29	5	2	36	43	.08	-.38	.08	1	1	.0	0	9.0	SE	39	W	15	23	5	2	2.1	94
Idaho Falls 46W CO	4933	848.0	1013.9	75	34	54.6	-1.4	90	1	18	30	1	13	--	--	.15	-.21	.12	2	0	T	0	8.1	---	a30	SW	28	--	--	--	---	--
Idaho Falls 43NW CO	4780	------	------	75	37	56.1	.7	91	1	22	19	1	6	--	--	1.10	.51	.65	2	0	.0	--	8.9	---	a36	SW	17	--	--	--	---	--
Lewiston	1413	963.1	1014.3	76	46	61.1	-2.1	91	10	30	30	1	1	--	--	1.01	.05	.65	4	3	.0	0	----	---	--	---	--	14	7	9	4.7	--
Pocatello	4444	862.2	1013.3	76	43	59.6	-.2	89	1+	25	30	0	3	31	38	.38	-.52	.29	3	3	T	0	11.1	SW	53	W	22	21	5	4	2.7	81
ILLINOIS																																
Cairo CO	314	1003.1	------	88	65	76.4	3.4	103	5	52	22+	13	0	--	--	3.56	.24	2.63	5	2	.0	0	6.5	---	32	SW	20	19	4	7	3.6	79
Chicago	610	992.6	1015.1	80	59	69.4	3.8	97	5+	46	22+	3	0	55	64	.83	-2.40	.33	7	2	.0	0	9.4	SW	35	NW	21	9	10	11	5.3	66
Moline	589	993.6	1015.7	80	55	67.5	2.1	97	4	36	23	5	0	56	70	1.59	-2.50	1.19	5	5	.0	0	7.9	SW	31	NW	21+	12	8	10	4.9	67
Peoria	654	993.2	1015.6	81	57	69.1	2.8	96	5	42	22	6	0	55	64	.93	-2.80	.60	6	4	.0	0	9.4	---	37	NW	21	13	9	8	4.6	75
Springfield	587	992.9	1015.8	85	59	71.6	4.7	100	4+	41	22	7	0	54	60	.91	-2.99	.60	6	5	.0	0	10.3	SSW	28	NW	21	14	9	7	4.1	78
INDIANA																																
Evansville	383	1001.7	1017.1	87	59	73.0	2.5	103	5	44	23	13	0	59	66	3.38	-.02	2.85	6	2	.0	0	6.1	SW	42	SE	20	18	5	7	3.4	78
Fort Wayne	801	984.8	1015.6	79	55	67.4	2.8	97	6	36	23	3	0	55	70	1.87	-1.20	1.06	8	4	.0	0	10.6	SW	36	W	21	11	8	11	5.1	59
Indianapolis	793	987.5	1016.5	82	57	69.6	2.4	100	5	42	23	5	0	56	68	.96	-2.71	.86	5	3	.0	0	9.1	SW	35	NW	21	12	11	7	4.2	80

See footnotes at end of table.

Table 2--Continued

State and station	Elevation (ground)	Pressure: Station	Pressure: Sea level	Temperature: Average maximum	Temperature: Average minimum	Temperature: Average	Temperature: Departure from normal	Temperature: Highest	Date	Temperature: Lowest	Date	No. of days: Max. 90° F. or above	No. of days: Min. 32° F. or below	Average dew point	Average relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Greatest in 24 hours	No. of days: .01 inch or more	No. of days: With thunderstorms	Snow, Sleet, Hail: Total	Snow, Sleet, Hail: Max. depth on ground	Wind: Average hourly speed	Wind: Prevailing direction	Fastest mile: Speed	Fastest mile: Direction	Fastest mile: Date	No. of days (sunrise to sunset): Clear	No. of days: Partly cloudy	No. of days: Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
INDIANA (Cont'd.)																																
South Bend	768	987.8	1015.6	78	55	66.2	1.6	97	6	36	23	3	0	56	72	1.63	-2.08	1.10	7	2	0.0	0	10.4	SSW	*30	WNW	21	9	9	12	5.7	--
IOWA																																
Burlington	694	990.2	1015.9	81	56	68.6	1.9	96	4+	38	22	6	0	55	68	1.68	-2.45	.60	6	5	.0	0	9.0	SSW	29	N	20	12	12	6	4.5	80
Des Moines	948	984.4	1015.4	79	57	67.8	2.0	95	4	38	22	4	0	54	67	1.98	-1.66	1.06	10	10	.0	0	11.2	SE	38	N	7	11	8	11	5.5	70
Dubuque	1065	976.6	1015.7	75	53	64.1	1.8	92	5	37	22	3	0	54	71	2.25	-1.93	1.67	6	3	.0	0	----	---	--	---	--	11	4	15	5.7	--
Sioux City	1094	972.6	1013.8	79	55	66.8	2.4	96	5	34	22	4	0	54	67	1.65	-1.59	.76	10	8	.0	0	9.2	SSE	42	SE	23	10	9	11	5.3	72
KANSAS																																
Concordia CO	1375	964.1	------	87	63	74.6	5.1	101	4	42	22	11	0	--	50	1.79	-.67	1.38	4	5	.0	0	8.4	---	24	N	20	22	4	4	2.7	83
Dodge City	2594	926.5	1012.3	88	62	74.7	4.8	100	18	45	30	14	0	50	47	1.37	-.34	.83	4	6	.0	0	15.1	S	49	NW	8	23	5	2	2.0	89
Goodland	3645	887.2	1011.7	86	53	69.4	4.8	99	1	34	30	12	0	45	47	.79	-.58	.75	2	5	T	0	9.7	SSE	*25	NW	14	20	7	3	2.4	--
Topeka	879	982.4	1014.3	89	61	75.2	6.2	104	3	39	22	15	0	54	52	.70	-2.74	.67	2	4	.0	0	11.3	SSW	34	SW	18	18	6	6	3.3	76
Wichita	1321	965.8	1013.2	90	65	77.6	5.9	103	3	49	22	17	0	52	46	1.09	-2.14	1.00	3	3	.0	0	12.9	S	34	N	9	19	7	4	2.8	89
KENTUCKY																																
Lexington	979	981.4	1016.8	86	61	73.6	4.7	103	5	47	22	12	0	57	62	4.97	2.14	3.26	5	4	.0	0	9.8	SSE	--	---	--	14	11	5	4.2	--
Louisville CO	457	------	------	86	64	75.4	4.3	103	5	53	23	12	0	--	--	5.52	2.83	4.50	6	2	.0	0	----	---	--	---	--	--	--	--	---	--
Louisville	474	999.7	1015.8	88	61	74.2	4.0	104	6+	47	23+	14	0	58	64	5.16	2.46	4.22	5	2	.0	0	6.3	SW	57	NW	19	16	9	5	3.9	78
LOUISIANA																																
Baton Rouge	64	1011.9	1014.7	91	68	79.7	2.2	97	10	58	23	23	0	67	73	3.21	-1.11	1.45	7	8	.0	0	7.1	NNE	--	---	--	14	12	4	3.9	--
Lake Charles	12	1013.2	1014.5	91	69	80.4	1.8	98	10	57	23	23	0	66	69	.70	-3.83	.39	6	4	.0	0	7.3	NE	*23	SE	17+	16	7	7	3.8	--
New Orleans CO	9	1012.9	------	89	75	82.4	2.1	97	10	67	23	18	0	--	--	5.83	.01	4.62	12	6	.0	0	6.3	---	22	E	16	10	14	6	4.5	70
New Orleans	3	1012.5	1014.8	90	72	80.7	1.2	97	10	65	13	15	0	70	76	6.66	1.60	3.62	11	7	.0	0	8.1	NE	*27	ENE	15	16	10	4	3.6	--
Shreveport	252	1005.8	1014.9	94	67	80.7	2.4	100	3	55	23+	25	0	62	59	2.27	.05	1.57	3	5	.0	0	8.3	S	--	---	--	20	4	6	3.1	82
MAINE																																
Caribou	624	991.2	1014.3	61	44	52.1	-1.1	76	2	33	15	0	0	46	82	8.14	4.64	6.23	14	2	.0	0	9.5	WSW	*45	NW	11	4	7	19	7.3	--
Portland	61	1011.5	1015.4	67	46	56.4	-2.2	82	8	34	24+	0	0	52	84	9.81	6.72	7.49	13	3	.0	0	8.7	NW	60	NW	11	9	7	14	6.1	60
MARYLAND																																
Baltimore CO	14	------	------	82	66	73.7	3.3	97	7	54	24	5	0	--	--	1.59	-1.87	.68	11	--	---	--	----	---	--	---	--	--	--	--	---	--
Baltimore	146	1012.2	1017.1	82	59	70.2	2.3	97	7+	43	24	5	0	58	71	1.16	-2.30	.26	11	7	.0	0	8.4	WSW	43	NW	11	16	5	9	4.5	70
Frederick	294	------	------	81	56	68.5	.0	95	6	40	24	5	0	--	--	.99	-2.57	.37	10	--	---	--	----	---	--	---	--	--	--	--	---	--
MASSACHUSETTS																																
Blue Hill Obs.	636	992.8	1016.1	68	52	59.5	-1.7	81	5	41	24	0	0	--	80	8.39	4.62	5.23	17	3	T	0	14.5	SSW	75	NW	11	8	5	17	6.3	49
Boston	15	1011.5	1015.8	70	56	63.2	-1.1	84	5	47	24	0	0	54	75	8.31	5.32	5.64	14	2	.0	0	12.0	SSW	*74	NW	11	10	6	14	6.3	60
Nantucket	43	1015.9	1016.2	67	55	60.9	-1.1	76	8+	46	19+	0	0	56	84	5.00	1.63	1.78	11	5	.0	0	13.5	SW	73	SE	11	9	7	14	6.0	62
Pittsfield	1153	972.9	1015.2	66	47	56.6	-1.7	77	28+	35	13	0	0	--	--	5.28	1.05	2.34	15	2	.0	0	----	---	--	---	--	--	--	--	---	--
MICHIGAN																																
Alpena CO	587	992.6	------	65	52	58.4	.0	87	2	39	23	0	0	--	--	6.08	2.88	1.35	19	6	.0	0	10.8	---	34	W	19	4	7	19	7.6	43
Detroit	619	988.8	1015.4	75	57	65.6	1.3	99	5	41	23	1	0	54	70	2.38	-.40	.77	11	5	.0	0	10.1	SW	44	WNW	21	7	11	12	5.9	54
Detroit (Willow Run)	722	987.1	1015.3	75	55	65.2	.9	100	5	37	23	1	0	54	71	3.30	.28	1.29	10	5	T	0	11.0	WNW	*37	WNW	21	7	12	12	5.8	--
East Lansing CO	856	983.4	------	75	54	64.4	2.6	95	5	37	23	2	0	--	--	2.24	-.81	.90	9	4	.0	0	4.9	---	15	SW	21	10	7	13	5.7	54
Escanaba	594	992.2	------	63	50	56.4	-1.0	80	2+	36	23	0	0	--	--	7.33	4.21	2.09	21	7	T	T	10.4	---	33	N	10	2	10	18	7.8	35
Grand Rapids	681	990.2	1015.0	73	53	63.3	1.4	97	6	33	23	2	0	57	74	2.13	-1.31	.60	14	6	.0	0	9.0	W	29	SW	27	8	7	15	6.4	46
Marquette CO	677	987.8	------	62	49	55.3	-2.5	77	27	40	23	0	0	--	79	5.61	2.18	1.59	23	4	.0	0	8.0	---	28	S	27	1	8	21	8.3	40
Muskegon	627	991.9	1015.1	71	54	62.8	1.5	95	6	33	23	1	0	55	76	2.13	-1.21	.76	12	8	.0	0	----	---	--	---	--	9	7	14	6.1	--
Sault Ste. Marie	721	992.6	1015.1	62	47	54.3	-.9	84	2	38	14	0	0	50	88	5.15	1.66	1.13	18	5	.0	0	8.9	WNW	31	W	20	0	10	20	8.4	26
MINNESOTA																																
Duluth	1409	973.6	1015.2	61	45	53.4	-2.0	82	1	32	22	0	1	48	84	2.92	-.30	.75	19	4	T	T	13.9	E	37	NE	13	3	3	24	8.1	39
Intern'l Falls	1179	971.6	1015.2	62	41	51.4	-1.9	81	1	27	22	0	2	45	80	2.99	.19	.93	9	3	.0	0	9.2	---	--	---	--	2	8	20	7.7	--
Minneapolis	830	981.7	1015.0	69	52	60.5	-1.7	88	1	36	22	0	0	51	76	3.65	.80	.88	14	7	.0	0	11.0	ESE	40	SE	18	9	4	17	6.6	39
Rochester	1017	977.7	1014.8	69	50	59.9	-.9	86	1	34	22	0	0	49	69	3.48	-.57	.71	11	7	.0	0	8.3	WNW	--	---	---	7	5	18	6.9	--
St. Cloud	1034	976.6	1014.7	66	47	56.3	-2.5	86	1	30	22	0	1	50	81	3.96	.96	.87	12	5	T	0	6.7	WNW	--	---	---	8	4	18	7.0	--
MISSISSIPPI																																
Jackson	315	1003.7	1015.7	93	66	79.4	2.7	103	4	53	23	23	0	62	63	2.98	.88	2.34	3	5	.0	0	6.0	NE	26	SW	5	17	9	4	3.4	78
Meridian	294	1002.4	------	93	63	78.3	2.4	100	6+	48	23	23	0	--	--	1.27	-1.34	.68	4	5	.0	0	----	---	--	---	--	16	10	4	3.6	--
Vicksburg CO	234	1006.8	------	90	68	78.7	1.7	97	5+	51	23	18	0	--	--	4.00	2.23	1.90	8	6	.0	0	7.4	---	35	E	5	18	6	6	3.4	73
MISSOURI																																
Columbia	778	986.8	1015.1	87	61	73.6	4.9	102	4	44	22	13	0	54	56	2.03	-2.59	1.09	7	6	T	T	8.2	S	33	NE	19	16	9	5	3.6	77
Kansas City	741	980.4	1014.6	88	65	76.5	5.9	103	2	49	22	14	0	53	49	.63	-3.22	.43	3	3	.0	0	10.7	S	42	S	28	18	6	6	3.3	83
St. Joseph	809	------	------	84	62	72.9	3.0	98	4	40	22	10	0	--	--	2.27	-2.02	1.60	4	3	T	T	----	---	--	---	--	--	--	--	---	--
St. Louis CO	465	995.6	------	86	66	75.6	4.2	102	5	51	22	10	0	--	--	4.75	1.37	4.18	5	3	1.0	1	10.3	---	34	S	29	14	9	7	4.2	72
St. Louis	552	995.6	1015.7	87	63	74.6	4.2	104	4	47	23	13	0	55	57	3.29	-.25	2.96	3	4	.0	0	7.5	S	--	---	--	14	9	7	4.3	--
Springfield	1265	968.5	1015.5	88	62	74.9	5.8	100	2+	47	22	14	0	55	55	3.83	-.03	2.07	4	5	.0	0	11.6	S	46	SW	28	14	12	4	3.4	86
MONTANA																																
Billings	3568	891.0	1013.7	73	47	59.9	-.1	92	11	32	30	1	1	42	56	1.06	-.26	.54	6	6	T	T	10.4	NE	47	NW	3	12	10	8	4.5	69
Glasgow CO	2090	940.1	1015.2	68	45	56.8	-1.2	85	3	26	30	0	2	43	67	1.14	-.08	.51	9	4	T	0	----	---	--	---	--	10	6	14	6.0	--
Great Falls	3664	888.6	1014.8	67	45	55.8	-1.1	88	2	29	30	0	3	38	58	1.86	.42	.99	11	4	7.7	6	12.3	WSW	4	S	19	13	8	9	5.1	69
Havre CO	2488	926.5	1015.2	69	45	57.0	.0	87	2	33	28	0	0	--	--	3.28	2.13	1.26	11	3	2.4	1	8.1	---	29	NW	12+	9	11	10	5.7	55
Helena	3893	873.7	1014.9	70	41	55.4	.5	85	2+	26	30	0	2	38	57	.65	-.51	.23	7	5	1.6	1	8.0	WNW	36	NW	2	12	6	12	5.1	65
Kalispell	2965	------	------	66	40	52.9	-1.6	80	10	25	30	0	2	--	--	.81	-.49	.24	10	5	T	T	----	---	--	---	--	10	7	13	5.6	--
Miles City	2629	930.6	1014.6	74	45	59.5	-.9	89	3	30	21	0	2	45	--	1.03	-.17	.56	7	3	T	T	9.2	NE	--	---	--	11	9	10	5.0	--
Missoula	3200	902.5	1016.6	69	41	54.8	-1.0	85	2	32	30	0	1	41	64	2.22	1.15	1.34	6	4	T	T	5.4	W	36	N	27	8	12	10	5.3	72
NEBRASKA																																
Grand Island	1841	948.2	1012.9	82	56	69.0	2.2	95	4	39	21	7	0	51	55	.86	-1.71	.75	2	4	.0	0	12.3	S	--	---	--	15	11	4	3.4	--
Lincoln CO	1184	------	------	83	60	71.5	3.4	101	4	39	22	7	0	--	--	1.27	-1.65	.76	6	5	.0	0	9.3	---	35	SE	8	12	11	7	4.1	81
Norfolk	1544	958.3	1013.5	80	54	67.3	2.8	97	4	32	22	5	1	52	60	1.06	-1.71	.37	8	9	.0	0	----	---	--	---	--	11	11	8	4.6	--
North Platte	2779	914.7	1012.0	82	51	66.4	2.6	99	3	32	21	4	1	50	61	.94	-.81	.36	5	8	.0	0	11.6	SE	47	NW	5	17	9	4	3.4	72
Omaha	978	973.9	1014.2	82	59	70.4	3.4	100	4	38	22	8	0	55	63	1.28	-1.88	.53	7	5	.0	0	11.4	SSE	36	SE	8	12	11	7	4.5	64
Scottsbluff	3950	878.8	1012.5	80	49	64.8	2.6	91	11	34	30	3	0	46	58	.70	-.59	.31	8	8	T	0	9.5	ESE	--	---	--	18	3	9	4.2	--
Valentine CO	2581	922.5	------	76	50	63.0	.4	89	23	33	21	0	0	--	--	2.08	.88	.81	8	8	T	0	7.8	---	27	SW	8	13	7	10	4.7	75
NEVADA																																
Elko	5075	844.2	1013.8	79	33	55.9	-1.9	91	1	17	29+	1	11	26	33	.02	-.37	.02	1	0	.0	0	5.7	W	*29	S	1	22	6	2	1.8	--
Ely	6257	809.3	1013.8	76	37	56.5	-1.3	84	1	20	30	0	8	29	38	1.48	.80	.77	6	5	T	T	13.0	---	52	S	22	21	4	5	2.6	85
Las Vegas	2162	942.1	1007.8	96	65	80.6	-.1	104	10	55	30	26	0	31	20	.45	.11	.44	2	2	.0	0	12.0	SW	*33	SW	16+	26	3	1	1.2	91
Reno	4397	861.5	1014.0	80	35	57.7	-2.8	93	1	25	30	1	8	29	40	.00	-.22	.00	0	0	.0	0	5.7	WNW	34	NW	15	26	4	0	1.0	98
Winnemucca	4299	867.3	1013.9	80	33	56.4	-3.5	95	1	17	29	4	15	23	28	T	-.34	T	0	0	.0	0	7.4	---	34	NW	14	24	6	0	1.2	97
NEW HAMPSHIRE																																
Concord	339	1004.7	1015.6	69	47	57.5	-1.3	82	5	34	13	0	0	51	79	5.42	2.03	3.02	14	4	.0	0	5.5	NW	37	NW	11	8	6	16	6.6	47
Mt Washington	6262	806.4	1011.9	44	33	38.3	-2.8	56	30	21	12	0	14	--	94	12.09	5.53	4.42	25	2	.2	T	31.0	W	*112	W	23	1	7	22	8.5	17

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
NEW JERSEY																																
Atlantic City CO	8	1014.6	1016.3	75	63	69.0	0.7	87	8	51	24+	0	0	--	--	5.06	1.55	4.43	8	3	0.0	0	15.3	---	65	NW	11	13	5	12	5.0	65
Newark	11	1015.2	1016.3	75	58	66.9	.1	89	5	46	23	0	0	56	72	5.80	1.91	4.06	10	4	.0	0	9.3	SW	*43	NW	11	12	6	12	5.6	--
Trenton CO	56	1009.1	1015.6	75	59	67.0	.0	89	7	48	24+	0	0	--	--	5.11	1.36	3.30	13	2	.0	0	8.3	---	*34	NW	11	13	5	12	5.3	61
NEW MEXICO																																
Albuquerque	5310	849.6	1011.6	86	60	72.8	2.9	92	2	52	27+	9	0	45	43	.77	-.28	.35	6	6	T	T	8.1	SE	36	NW	9	20	7	3	2.7	82
Clayton	4969	846.6	1012.8	83	55	68.8	2.9	93	18	44	30	6	0	--	--	.39	-1.48	.39	2	4	.0	0	----	---	--	---	--	25	3	2	1.6	--
Roswell	3612	893.3	1012.2	90	59	74.4	3.1	98	19	49	22	21	0	48	45	.47	-1.53	.21	5	3	.0	0	7.5	---	33	SW	2	22	5	3	2.3	--
NEW YORK																																
Albany	277	1011.9	1015.4	70	50	60.4	-1.2	86	5	37	13	0	0	53	78	2.08	-1.07	.86	10	3	.0	0	7.7	SSE	37	NW	22	6	6	18	7.0	34
Binghamton	1601	957.3	1016.0	68	51	59.6	-.2	86	7	38	24+	0	0	52	79	2.48	-.78	1.27	12	4	.0	0	10.5	WNW	37	W	22	3	10	17	7.4	46
Buffalo	693	987.8	1015.7	71	54	62.3	-.1	88	29	40	24	0	0	53	74	2.20	-.81	.71	12	4	T	0	14.3	SW	59	SW	21	1	15	14	7.2	48
New York CO	10	1005.1	------	74	60	66.9	-.4	89	6	49	23	0	0	--	--	6.30	2.63	4.98	10	5	.0	0	11.5	---	61	NW	11	13	4	13	5.4	57
New York	19	1014.9	1016.5	76	61	68.3	-.1	89	5	51	24+	0	0	57	71	5.25	1.70	3.45	11	5	.0	0	9.0	SW	52	N	11	11	6	13	5.5	--
Rochester	543	995.9	1015.1	70	52	61.3	-.7	88	29	39	24	0	0	53	78	1.93	-.73	.44	10	5	.0	0	9.0	WSW	57	W	22	1	14	15	7.1	42
Schenectady	217	------	------	70	52	61.0	-.8	86	5	42	24+	0	0	--	--	2.15	-1.11	.69	15	2	.0	0	----	---	--	---	--	10	15	5	4.6	--
Syracuse	424	994.6	1016.1	71	53	61.9	-1.5	90	7	43	13	0	0	53	74	3.06	.15	.89	13	5	.0	0	8.6	NW	36	NW	22	4	9	17	7.2	42
NORTH CAROLINA																																
Asheville CO	2203	------	------	84	56	70.2	2.3	95	6+	43	23	8	0	--	--	1.12	-1.60	.55	5	1	.0	0	5.3	---	27	N	20	15	8	7	3.8	81
Asheville	2093	945.8	1018.4	--	--	----	---	---	--	--	--	--	--	56	77	----	----	----	--	--	---	--	2.3	NNW	--	---	--	--	--	--	---	--
Charlotte	741	990.2	1017.4	91	63	77.3	4.7	104	6	53	24	16	0	60	62	.02	-3.63	.02	1	1	.0	0	7.3	S	34	SW	21	15	8	7	4.0	87
Greensboro	891	986.8	1018.2	88	59	73.5	2.8	100	6	46	24	11	0	58	65	.35	-3.31	.33	3	1	.0	0	6.7	SW	24	NNW	11	16	8	6	3.6	85
Hatteras	4	1016.6	1017.1	81	70	75.7	.4	89	7	63	25	0	0	68	79	10.75	4.66	3.71	10	5	.0	0	11.1	SSW	56	NW	10	13	6	11	5.2	65
Raleigh	438	1001.7	1017.3	88	62	74.9	2.3	104	6	49	24	12	0	60	68	.57	-3.92	.40	6	3	.0	0	7.6	SW	--	---	--	16	9	5	3.8	71
Wilmington	30	1016.3	1017.7	85	66	75.7	.3	95	6	56	25	8	0	--	--	2.87	-3.08	.99	8	2	.0	0	7.9	---	34	N	10	17	4	9	4.5	74
Winston-Salem	967	983.1	1017.9	88	62	74.7	3.8	100	6	49	24	11	0	58	59	.42	-3.07	.42	1	2	.0	0	7.1	WSW	*23	WSW	21	19	4	7	3.2	--
NORTH DAKOTA																																
Bismarck	1650	955.0	1015.1	68	45	56.8	-1.7	85	26	30	21	0	1	46	73	2.69	1.26	1.17	8	3	.0	0	11.7	E	49	NW	20	9	9	12	5.8	57
Devils Lake CO	1471	961.7	------	63	45	54.0	-2.3	81	1	33	22	0	0	--	--	3.66	1.59	1.52	8	5	.0	0	8.9	---	33	NW	20	9	6	15	6.1	54
Fargo	895	980.4	1014.9	67	47	57.0	-1.9	86	1	31	22	0	1	48	75	2.68	.96	1.33	11	2	.0	0	13.8	ENE	50	W	20	7	8	15	6.7	53
Williston CO	1877	947.5	1015.4	65	44	54.7	-2.5	83	26	27	30	0	2	45	71	3.62	2.41	1.48	10	4	.0	0	8.0	---	30	W	1+	8	6	16	6.4	54
OHIO																																
Akron	1210	979.0	1017.0	77	54	65.2	.6	98	5	39	24+	2	0	54	72	1.98	-1.65	.77	6	3	T	0	8.6	SW	--	---	--	9	15	6	5.3	--
Cincinnati Obs.	761	------	------	85	59	71.9	3.0	101	6	45	23	8	0	--	--	2.02	-.86	1.42	8	5	.0	0	5.0	---	20	W	21	--	--	--	---	80
Cincinnati	869	985.1	1016.7	84	58	71.1	3.8	101	6	46	23	9	0	56	64	2.12	-.85	1.43	8	6	T	0	7.9	SSW	*35	WSW	19	12	12	6	4.4	--
Cleveland CO	663	------	------	76	60	68.0	1.7	100	5	44	24	2	0	--	--	2.33	-.90	.82	6	--	.0	0	----	---	--	---	--	--	--	--	---	--
Cleveland	787	988.2	1015.9	78	58	67.8	2.3	99	5	41	24	2	0	55	69	1.98	-1.15	.64	8	3	.0	0	9.8	S	40	W	21	7	11	12	5.9	57
Columbus CO	724	------	------	80	62	71.0	3.2	98	6	46	23	2	0	--	--	.44	-2.14	.13	7	--	.0	0	----	---	--	---	--	--	--	--	---	--
Columbus	815	986.8	1016.5	82	56	69.0	2.5	99	6+	40	23	2	0	57	71	.74	-2.17	.21	8	5	.0	0	6.1	SE	35	W	21	11	13	6	4.6	78
Dayton	1002	980.4	1016.4	82	58	69.9	3.0	101	6	42	23	4	0	56	67	.47	-2.33	.16	8	2	.0	0	7.9	S	38	W	21	10	14	6	4.6	83
Portsmouth CO	715	------	------	84	55	69.3	1.6	97	6	40	24	8	0	--	--	1.94	-.90	1.03	8	7	.0	0	3.1	---	*34	W	21	--	--	--	---	--
Sandusky CO	603	993.9	------	77	61	68.9	2.4	98	5	45	24	1	0	--	--	1.21	-2.05	.38	6	4	.0	0	6.6	---	31	W	21	10	10	10	5.1	62
Toledo	622	993.2	1015.8	78	56	66.7	2.5	95	5	37	23	2	0	55	72	1.00	-2.02	.32	7	4	.0	0	9.9	SW	41	SW	30	12	8	10	5.2	69
Youngstown	1178	974.6	1016.7	76	53	64.7	.0	99	5	35	24	2	0	53	73	3.73	.15	1.36	9	5	.0	0	8.7	SW	*38	WSW	21	9	10	11	5.9	--
OKLAHOMA																																
Oklahoma City	1280	971.6	1014.2	93	65	79.0	5.0	102	3	50	22	23	0	52	44	.63	-2.80	.56	3	2	.0	0	11.9	SSE	45	SW	29	22	6	2	2.1	88
Tulsa	672	990.2	1014.1	94	66	79.9	6.1	103	3	49	22	22	0	56	48	1.23	-3.02	.70	4	4	.0	0	10.7	S	40	N	20	21	4	5	3.0	88
OREGON																																
Astoria	12	1015.9	1017.2	67	50	58.6	-1.7	78	24	39	29	0	0	54	85	2.01	-1.07	.78	10	0	.0	0	4.9	SE	--	---	--	6	4	20	7.3	--
Burns CO	4140	872.7	1014.4	74	38	56.3	-2.0	92	1	25	30	1	5	31	41	.10	-.33	.06	3	0	.0	0	----	---	--	---	--	18	9	3	2.6	--
Eugene	361	1002.7	1016.3	72	46	59.0	-1.9	85	25	33	29	0	0	49	75	.95	-.65	.39	7	2	.0	0	6.0	N	*28	S	11	10	7	13	5.6	--
Meacham	4050	------	------	65	41	52.7	-3.0	82	10	27	30	0	2	--	--	1.18	-.28	.65	4	0	.6	T	----	---	--	---	--	14	6	10	4.7	--
Medford	1312	968.2	1015.4	77	45	61.4	-3.0	94	25	34	29+	4	0	45	62	1.18	.53	.40	4	1	.0	0	2.5	WNW	*23	WSW	11	20	5	5	2.9	--
Pendleton	1489	961.4	1014.8	75	49	62.0	-2.6	90	9	33	30	1	0	41	50	.75	.04	.58	4	2	.0	0	8.9	W	--	---	--	15	7	8	3.9	--
Portland	22	1010.5	1016.2	70	50	60.2	-2.1	83	25	35	30	0	0	53	79	.85	-.99	.23	11	1	.0	0	4.7	NW	23	S	7	6	7	17	6.8	46
Roseburg	505	997.3	1015.9	73	46	59.5	---	87	25	32	30	0	1	--	--	1.06	-.05	.36	7	1	.0	0	4.2	---	19	N	27+	11	8	11	5.6	54
Salem	195	1008.8	1016.2	73	45	59.0	-3.4	84	1+	34	30	0	0	50	75	1.28	-.21	.72	7	1	.0	0	5.3	S	--	---	--	6	9	15	6.5	--
Sexton Summit CO	3836	------	------	65	46	55.5	-4.3	83	25	37	28	0	0	--	--	1.89	.72	.99	5	0	.0	0	----	---	--	---	--	18	6	6	3.3	--
PENNSYLVANIA																																
Allentown	376	1002.7	1016.9	75	55	64.5	-.2	90	6	41	24	1	0	57	79	2.96	-.51	.99	9	2	.0	0	8.0	WSW	--	---	--	12	7	11	5.4	--
Harrisburg	335	1003.4	1016.8	78	58	67.7	1.6	93	6+	44	24+	3	0	56	70	1.51	-1.12	.56	8	6	.0	0	6.1	WSW	36	SW	19	11	8	11	5.2	65
Philadelphia CO	26	------	------	78	62	70.0	.7	92	6	52	24+	2	0	--	--	3.51	.08	2.19	10	2	.0	0	7.5	---	24	N	11	11	9	10	5.6	56
Philadelphia	13	1011.9	1016.3	78	60	69.1	1.4	92	7+	47	23	3	0	59	72	3.26	-.20	1.63	8	2	.0	0	8.4	WSW	*30	NNW	11	12	8	10	5.5	--
Pittsburgh CO	749	------	------	79	60	69.4	1.5	97	5	43	24	2	0	--	--	2.31	-.46	.93	9	--	.0	0	----	---	--	---	--	--	--	--	---	58
Pittsburgh	1151	986.5	1016.8	78	56	66.8	1.9	97	5	39	24	2	0	56	70	1.80	-1.17	.92	4	6	.0	0	9.9	WSW	*30	SW	21	12	9	9	5.1	56
Reading CO	266	1004.4	1015.9	77	59	68.1	1.0	92	7+	45	24	3	0	--	--	1.63	-1.65	.49	11	2	.0	0	9.6	---	42	N	26	11	5	14	5.8	54
Scranton CO	746	987.5	1016.3	73	55	63.9	.2	90	7	41	13	1	0	--	--	2.21	-.72	.82	10	4	.0	0	6.0	---	27	NW	11	8	13	9	5.9	53
Williamsport	527	997.3	1016.3	76	54	64.9	.3	95	5	41	13	2	0	--	--	1.59	-1.74	.56	10	5	.0	0	----	---	*32	NW	11	8	9	13	6.2	--
RHODE ISLAND																																
Block Island	110	1011.9	1016.0	69	57	62.7	-.8	82	6	50	25+	0	0	--	--	7.42	4.44	4.04	11	5	.0	0	----	---	--	---	--	10	5	15	6.3	--
Providence	55	1010.2	1015.9	71	54	62.2	-.5	81	6	44	25+	0	0	54	78	6.04	2.85	4.37	10	3	.0	0	11.1	SW	*55	NW	11	10	4	16	6.3	45
SOUTH CAROLINA																																
Charleston CO	9	------	------	84	73	78.4	.7	89	21+	66	3	0	0	--	--	5.20	-.11	2.02	6	4	.0	0	10.3	---	29	N	10	12	8	10	5.1	75
Charleston	41	1015.2	1017.0	87	68	77.5	1.2	93	21+	57	3	10	0	68	78	1.55	-3.92	.92	5	1	.0	0	7.9	NNE	--	---	--	9	11	10	5.5	--
Columbia	217	1008.8	1017.1	91	65	78.1	2.2	101	6	49	24	18	0	64	70	1.75	-2.67	1.21	3	1	.0	0	5.3	SSW	--	---	--	16	7	7	3.9	79
Florence	146	1011.9	1017.3	91	65	78.0	2.7	101	6	53	24	17	0	--	--	.87	-3.41	.62	5	3	.0	0	----	---	--	---	--	15	8	7	4.3	--
Greenville	1018	980.4	1016.9	89	65	77.0	3.9	101	6	55	22	13	0	57	55	.52	-3.07	.50	2	3	.0	0	8.1	NE	32	W	21	16	7	7	4.1	83
Spartanburg	801	------	------	89	64	76.9	3.7	100	6	54	22	14	0	--	--	.13	-3.55	.13	2	2	.0	0	5.6	---	25	W	21	17	7	6	3.8	--
SOUTH DAKOTA																																
Huron	1282	966.8	1013.7	74	50	62.2	-.6	90	1	33	22	1	0	49	68	.92	-.81	.52	10	8	.0	0	10.1	NW	43	NW	20	12	6	12	5.7	61
Rapid City	3165	900.8	1013.6	77	49	63.2	2.7	94	22	29	21	2	1	43	52	.20	-.98	.09	4	3	.0	0	11.1	NNW	52	NW	28	15	6	9	4.1	65
Sioux Falls	1420	963.1	1014.1	74	51	62.5	.1	88	1	31	22	0	1	50	69	4.33	1.40	2.18	13	10	.0	0	9.7	NW	*34	SE	8	9	10	11	5.4	--
TENNESSEE																																
Bristol	1519	964.1	------	87	58	72.5	4.0	100	7+	45	22	12	0	--	--	2.64	-.15	1.60	4	2	.0	0	----	---	--	---	--	16	7	7	3.8	--
Chattanooga	670	989.8	1017.0	91	61	75.9	3.4	102	5+	51	25	15	0	61	68	3.45	.76	2.72	3	1	.0	0	2.0	SSW	32	SW	19	13	10	7	4.2	73
Knoxville	950	982.7	1017.4	90	63	76.0	3.9	103	5	51	22	15	0	57	58	1.30	-1.23	.61	4	3	.0	0	5.7	ENE	31	SW	19	15	8	7	4.1	71
Memphis CO	271	------	------	89	69	79.0	4.2	102	5	55	23	17	0	--	--	1.83	-.67	.88	5	--	.0	0	----	---	--	---	--	--	--	--	---	--
Memphis	263	1001.4	1016.0	91	65	78.0	3.7	103	5	52	24	21	0	60	60	1.43	-1.12	.70	4	4	.0	0	7.4	S	29	S	20	15	9	6	3.6	82
Nashville	577	998.6	1016.7	90	63	76.8	3.6	105	5	49	22	16	0	59	61	4.28	1.54	3.00	7	5	.0	0	4.2	S	36	NW	20	15	8	7	4.1	74
Oak Ridge CO	905	984.4	------	89	59	73.8	2.5	102	6+	45	22	14	0	--	--	3.73	1.18	1.92	5	4	.0	0	3.3	---	18	SW	21	16	5	9	4.2	--

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature										Average dew point	Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below			Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.		‡		°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
TEXAS																																
Abilene	1759	953.3	1012.7	94	67	80.4	4.9	101	20	54	22	25	0	53	43	0.77	-1.83	0.32	5	2	.0	0	11.4	SSE	55	SW	20	24	5	1	1.8	93
Amarillo	3590	889.6	1012.2	90	61	75.3	6.0	97	18	52	21	18	0	46	41	.30	-1.98	.19	4	4	.0	0	13.6	S	36	SW	27	23	4	3	2.2	84
Austin	615	992.9	1014.1	95	70	82.4	3.1	102	2	58	23+	25	0	63	58	.82	-3.24	.70	3	2	.0	0	8.8	SSE	29	S	7	20	7	3	2.9	86
Brownsville	16	1010.2	1012.3	92	75	83.3	1.9	95	1+	68	23	27	0	73	77	4.73	-1.54	1.59	11	10	.0	0	9.3	SE	32	SE	30	7	20	3	5.1	67
Corpus Christi	40	1012.5	1013.5	93	76	84.2	4.0	102	11	69	23	27	0	73	72	3.56	-1.14	2.52	7	6	.0	0	9.9	E	30	E	5	13	14	3	4.3	85
Dallas	487	996.3	1014.6	95	69	82.2	3.3	102	2+	54	22	26	0	59	49	2.92	.21	1.10	5	5	.0	0	9.6	SE	47	NW	20	24	4	2	1.8	92
Del Rio	1091	979.0	1012.4	96	71	83.5	3.7	101	10	60	23	29	0	61	49	1.75	-.76	1.46	2	2	.0	0	9.3	---	34	SE	6	21	6	3	2.5	85
El Paso	3920	885.5	1010.7	90	67	78.5	3.6	97	20	62	30	20	0	51	41	.95	-.18	.80	4	1	.0	0	9.7	S	35	NE	9	24	2	4	2.4	91
Fort Worth	544	994.2	1014.5	95	69	81.9	3.7	101	2+	55	22+	25	0	57	47	1.46	-1.23	.63	4	5	.0	0	12.4	ESE	*33	ENE	7	24	5	1	1.8	--
Galveston CO	7	------	------	87	77	81.9	1.6	94	10	69	23	3	0	--	--	2.87	-2.57	.84	8	--	.0	0	11.4	---	32	NE	16	--	--	--	---	85
Galveston	5	1012.2	1014.4	88	77	82.6	2.2	93	10	68	23	9	0	73	75	2.22	-3.60	.77	8	5	.0	0	9.6	SE	--	---	--	18	9	3	3.1	--
Houston CO	41	1009.1	------	92	73	82.2	2.2	97	10	60	23	23	0	--	--	.45	-3.20	.31	6	4	.0	0	9.1	---	27	SE	29	15	9	6	4.0	86
Houston	50	1011.5	1013.8	91	72	81.4	2.7	98	10	58	23	23	0	68	70	.49	-3.86	.42	4	5	.0	0	10.6	SE	--	---	--	15	9	6	4.0	--
Laredo	500	997.3	1012.1	96	74	85.1	1.6	100	20+	65	23	30	0	68	63	2.26	-.90	.98	8	3	.0	0	12.6	SE	*28	E	5+	14	13	3	4.0	--
Lubbock	3243	903.5	1012.6	89	60	74.8	3.6	95	19+	51	22	17	0	52	47	T	-2.85	T	0	0	.0	0	11.2	S	*27	SW	19	21	7	2	2.0	--
Midland	2854	916.0	1012.5	92	65	78.2	2.9	101	20	54	24	22	0	49	39	.15	-1.99	.15	1	1	.0	0	6.2	SE	*25	ENE	21	26	4	0	1.4	--
Port Arthur	16	1012.5	1014.3	91	70	80.5	2.6	95	1+	55	23	22	0	69	74	1.01	-3.87	.39	7	6	.0	0	10.4	NE	33	N	21	18	9	3	3.5	81
San Angelo	1903	947.2	1013.0	93	67	79.8	3.3	101	20	50	22	24	0	54	43	.24	-2.06	.20	3	3	.0	0	8.4	S	*30	ENE	21	26	3	1	2.0	--
San Antonio	792	989.2	1013.4	95	71	82.6	3.2	99	2+	57	24	28	0	62	55	.52	-2.85	.69	3	0	.0	0	7.8	SSE	35	SW	1	21	7	2	3.0	87
Victoria	110	1008.8	1013.3	95	73	84.1	3.3	100	10+	61	23	29	0	67	63	2.64	-1.05	2.37	6	6	.0	0	7.9	---	%32	SE	5	16	12	2	3.7	--
Waco	500	995.6	1013.9	95	70	82.2	3.3	101	2	55	24	26	0	61	52	.56	-2.41	.36	2	4	.0	0	11.0	S	--	---	--	21	7	2	2.4	--
Wichita Falls	1027	977.3	1013.1	95	69	82.3	4.9	103	3	53	24	27	0	53	40	.30	-2.42	.20	3	1	.0	0	9.1	S	*23	SSW	29	25	5	0	1.6	--
UTAH																																
Milford	5028	844.2	1013.2	81	46	63.6	1.0	94	1	28	30	1	3	--	--	.55	.15	.27	5	9	.0	0	----	---	--	---	--	17	9	4	3.1	--
Salt Lake City	4222	866.6	1012.3	80	50	64.8	.6	93	1+	30	30	4	1	42	49	.59	-.15	.36	6	5	.0	0	9.0	SSE	32	SE	11	17	7	6	3.2	81
VIRGINIA																																
Lynchburg	947	984.1	1017.3	86	60	72.6	3.8	101	6	48	24	10	0	--	--	1.47	-1.63	1.20	3	3	.0	0	7.1	---	29	NW	19	18	5	7	3.8	81
Norfolk	26	1016.6	1017.5	83	64	73.8	1.8	98	7	52	24	5	0	64	75	2.77	-1.09	2.17	4	5	.0	0	7.6	SW	33	N	11	12	12	6	4.3	66
Richmond	162	1011.5	1017.2	88	61	74.4	4.1	103	7	47	24	12	0	60	68	.69	-2.96	.33	5	5	.0	0	7.6	SW	26	NW	21	17	7	6	3.8	76
Roanoke	1174	976.3	1017.8	86	58	71.9	2.8	101	5	45	23	11	0	56	64	1.13	-2.26	.94	4	3	.0	0	6.3	WSW	--	---	--	18	7	5	3.9	--
WASHINGTON																																
Olympia	190	1009.1	1016.5	68	47	57.8	-.3	78	9	30	30	0	1	51	80	1.89	.09	.74	12	0	.0	0	5.1	SSW	*20	SSW	7	1	10	19	7.8	--
Seattle CO	14	------	------	67	54	60.5	-.4	75	9	46	29+	0	0	--	--	1.66	.10	.66	8	2	.0	0	7.3	---	27	SE	8	5	5	20	7.6	40
Seattle	14	1015.6	1016.5	--	--	----	---	---	--	--	--	--	--	52	78	----	----	----	--	--	---	--	6.4	SSE	--	---	--	--	--	--	---	--
Seattle-Tacoma	379	1002.7	1016.9	66	51	58.7	.0	76	9	37	29	0	0	53	84	1.68	.03	.57	12	2	.0	0	8.4	SSW	--	---	--	4	10	16	7.4	--
Spokane	2357	946.5	1015.2	69	46	57.5	-1.7	85	10	34	29	0	0	42	61	1.55	.62	.70	7	2	.0	0	6.6	NE	26	S	3	10	7	13	5.5	71
Stampede Pass CO	3958	880.1	1018.2	56	42	49.3	-1.9	74	25	33	29+	0	0	--	--	2.45	-1.59	.60	18	2	T	T	----	---	--	---	--	6	4	20	7.0	--
Tatoosh CO	101	1012.9	1016.4	61	54	57.2	2.7	65	13	45	30	0	0	54	90	2.74	-.90	.88	13	0	.0	0	9.4	E	30	S	8	2	7	21	8.0	32
Walla Walla CO	949	979.0	1014.6	75	53	64.0	-1.3	91	9	35	30	1	0	--	--	.61	-.25	.51	3	1	.0	0	5.2	---	25	W	10	17	6	7	3.7	72
Walla Walla	1200	------	------	--	--	----	---	---	--	--	--	--	--	45	--	----	----	----	--	--	---	--	7.0	S	--	---	--	--	--	--	---	--
Yakima	1061	976.0	1015.8	75	44	59.5	-1.6	87	26	31	30	0	2	43	57	.83	.44	.83	1	1	.0	0	9.0	WNW	--	---	--	13	12	5	4.2	--
WEST VIRGINIA																																
Charleston	950	982.1	1017.3	83	58	70.5	1.9	97	5	44	24	4	0	60	77	2.92	-.02	1.94	8	4	.0	0	6.1	S	*30	NNW	19	7	16	7	5.4	--
Elkins	1970	------	------	78	51	64.2	1.2	92	5	34	24	1	0	--	--	2.45	-.83	1.01	7	4	.0	0	3.1	---	*20	WNW	19	7	15	8	5.2	--
Huntington CO	565	------	------	86	60	72.8	2.3	102	6	47	24	12	0	--	--	4.00	1.12	2.70	6	--	.0	0	----	---	--	---	--	--	--	--	---	--
Parkersburg CO	615	------	------	83	59	70.5	2.1	98	6	43	24+	5	0	--	--	1.73	-1.26	.77	8	5	.0	0	4.8	---	61	NW	19	13	12	5	4.2	75
Parkersburg	837	------	1016.9	--	--	----	---	---	--	--	--	--	--	60	--	----	----	----	--	--	---	--	5.1	SSW	--	---	--	--	--	--	---	--
WISCONSIN																																
Green Bay	689	992.6	1015.3	69	49	58.7	-1.5	91	6	32	23	1	1	52	82	5.78	2.91	1.60	19	6	T	T	8.9	WNW	47	SW	18	8	3	19	7.3	39
La Crosse	652	990.2	1014.6	71	53	62.1	-.2	92	6	39	23	1	0	54	76	4.85	1.03	1.41	11	7	.0	0	8.5	SE	*27	NW	20	7	5	18	6.9	--
Madison	857	980.0	1015.0	74	52	62.9	.8	95	6	35	23	4	0	54	75	3.82	-.17	1.63	11	6	.0	0	9.6	NW	41	NW	19	8	8	14	6.0	59
Milwaukee	675	990.5	1015.2	73	56	64.3	1.7	93	6	41	23	1	0	55	74	2.78	-.55	.83	11	5	T	T	11.3	SW	36	SW	19	10	6	14	5.9	59
WYOMING																																
Casper	5322	837.1	1011.3	78	47	62.5	4.4	91	1	32	29	1	1	33	40	.23	-.99	.09	5	4	T	T	12.1	SW	--	---	--	17	7	6	3.7	--
Cheyenne	6139	813.1	1013.1	76	47	61.4	4.0	88	11	30	29	0	2	38	49	1.08	-.12	.48	9	8	2.2	1	10.5	W	49	NW	28	12	10	8	4.6	69
Lander	5563	835.4	1013.1	77	45	61.1	3.6	91	1	32	29+	1	2	32	38	.18	-1.05	.08	4	3	T	0	7.8	---	45	W	12	19	4	7	3.4	85
Sheridan	3942	883.5	1013.8	76	44	60.0	2.1	95	11	32	19+	1	2	--	--	1.03	-.42	.44	5	4	2.0	1	7.1	WNW	37	NW	5+	18	5	7	3.5	75
PACIFIC AREA																																
Canton Island	9	1010.2	1010.7	90	78	83.8	-.6	92	17+	76	1+	17	0	73	74	.13	-.56	.07	5	0	.0	0	----	---	--	---	--	22	6	2	3.4	--
Hilo	31	1013.9	1015.2	83	68	75.5	.2	87	1	66	8+	0	0	68	80	8.22	-2.20	2.47	24	0	.0	0	6.2	WSW	*22	E	5+	3	14	13	6.6	52
Honolulu	7	1015.2	1015.7	85	73	79.3	.1	87	2+	69	28	0	0	67	67	.54	-.60	.38	6	0	.0	0	12.0	ENE	29	E	16	11	17	2	4.5	78
Koror CO	94	1006.1	1009.9	88	75	81.6	.5	92	24	72	11	6	0	76	83	14.64	1.33	3.09	26	6	.0	0	----	---	--	---	--	0	11	19	8.1	--
Lihue	115	1010.5	1015.7	85	73	78.6	.8	86	4+	68	20	0	0	69	74	1.32	-.88	.54	14	0	.0	0	11.1	NE	26	NE	15	3	23	4	5.8	56
Ponape CO	112	1005.4	1010.6	87	72	79.7	-.4	91	7+	69	13	4	0	74	86	17.73	1.77	4.87	27	1	.0	0	----	---	--	---	--	0	9	21	8.2	--
Truk (Moen Island)	8	1010.2	1010.4	86	75	80.1	-.6	88	11+	72	12+	0	0	76	87	17.02	4.41	3.55	26	1	.0	0	----	---	--	---	--	1	3	26	8.9	--
Wake Island	11	1012.2	1012.5	86	77	81.7	-.5	88	16+	71	29	0	0	75	81	4.10	-1.38	.88	23	1	.0	0	11.6	E	--	---	--	3	8	19	7.5	--
Yap CO	53	1007.8	1009.7	89	75	81.8	.0	92	2	73	22+	9	0	76	84	9.74	-4.42	2.16	24	2	.0	0	----	---	--	---	--	1	8	21	8.2	--
WEST INDIES																																
San Juan, P.R. CO	47	------	------	85	75	79.9	-.6	90	7	72	17+	1	0	--	--	10.15	4.15	3.36	20	12	.0	0	----	---	--	---	--	--	--	--	---	--
San Juan, P.R.	9	1012.2	1014.4	86	75	80.4	-.1	91	8	72	17+	2	0	73	82	9.82	2.80	2.69	21	12	.0	0	9.6	SSE	26	E	30	3	14	3	6.9	64
ALASKA																																
Anchorage	92	1007.8	1013.0	56	41	48.5	.5	64	2	30	22	0	4	42	77	1.66	-1.05	.61	16	0	.0	0	2.7	NNE	*16	NNW	11	6	1	23	7.8	43
Annette	110	1011.2	1015.2	60	49	54.5	1.4	72	10	41	30	2	0	50	85	5.30	-4.30	1.17	16	0	.0	0	12.3	SSE	*32	SSE	25	5	8	17	7.2	--
Barrow	22	1010.5	1011.1	41	31	35.8	5.2	61	2	12	24	0	18	33	90	.54	-.01	.16	10	0	1.7	3	13.5	---	47	NW	17	0	4	26	9.1	--
Bethel	21	1009.8	1011.3	52	39	45.1	-.2	70	30	23	26	1	8	41	87	5.21	2.20	1.55	16	0	.0	0	11.1	S	*32	SSE	4	3	0	27	8.8	--
Cordova	40	1010.2	1012.1	59	40	49.2	1.2	70	17	29	13	1	5	43	81	9.76	-5.71	2.24	13	1	.0	0	5.0	E	*23	SE	4	3	2	25	9.4	--
Fairbanks	436	996.3	1013.2	53	32	42.7	-1.9	67	2+	19	19	0	18	35	76	1.82	.61	1.21	8	0	T	0	4.3	N	17	SW	9+	6	6	18	7.1	--
Juneau	15	1012.9	1013.8	58	40	49.2	.2	68	8	31	19+	0	3	44	82	5.03	-1.89	1.42	15	0	.0	0	6.8	N	34	SE	25	5	6	19	7.7	41
Kotzebue	10	1010.8	1011.5	45	35	40.1	-.8	58	1	21	24	0	10	35	84	2.66	1.72	.79	16	0	T	0	16.1	SE	*32	SW	9	4	3	23	8.2	--
McGrath	334	1000.3	1012.9	51	35	42.8	-1.2	59	1	19	26	0	14	37	79	3.59	1.18	.99	17	0	.2	T	4.3	N	*21	S	8	3	5	22	8.0	--
Nome	13	1009.8	1010.4	47	37	42.0	.0	52	16	22	20+	0	9	36	80	4.01	1.08	1.02	19	0	.0	0	13.5	SSE	43	S	9	6	2	22	8.6	41
Northway	1713	950.9	1014.4	50	29	39.8	-2.7	67	3	18	27	0	19	33	79	.90	-.28	.42	6	0	T	T	7.1	NW	*22	NW	25+	3	3	24	8.3	--
St. Paul Island	22	1008.1	1009.1	48	42	45.0	-.3	52	4+	32	22	0	1	43	93	4.71	1.22	.94	19	0	.3	T	----	---	--	---	--	1	3	26	9.2	--
Yakutat	28	1011.9	1013.0	58	40	49.1	.7	68	8	29	28	0	3	45	86	9.05	-7.27	2.14	14	0	T	0	7.0	ESE	*35	SE	22	4	5	21	7.8	--

Data from airport unless otherwise specified. CO indicates data from city office.
* Data entered in column "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.
+ And also on a later date or dates.
% Peak gust.
‡ Max. 70°F. or above for Alaskan Stations.
a Maximum hourly average.

HEATING DEGREE DAYS

Table 3

(Base 65°F.)

SEPTEMBER 1954

State and station	Current season		Normals July through this month
	This month	Period July through this month	
ALABAMA			
Birmingham	1	1	13
Mobile	0	0	0
Montgomery (CO)	0	0	0
Montgomery	0	0	0
ARIZONA			
Flagstaff	210	333	370
Phoenix (CO)	0	0	0
Phoenix	0	0	0
Prescott	11	11	34
Tucson	0	0	0
Yuma	0	0	0
ARKANSAS			
Ft. Smith	1	1	9
Little Rock	0	0	10
Texarkana	0	0	0
CALIFORNIA			
Bakersfield	0	0	0
Bishop	27	31	55
Blue Canyon	169	307	182
Burbank	1	1	11
Eureka (CO)	217	750	779
Fresno	0	0	0
Los Angeles (CO)	0	0	17
Los Angeles	3	3	109
Mt. Shasta (CO)	238	387	248
Oakland	62	228	237
Red Bluff	8	11	0
Sacramento (CO)	4	4	17
Sacramento	7	7	22
Sandberg (CO)	34	74	28
San Diego	0	0	42
San Francisco (CO)	118	525	476
San Francisco	104	334	381
San Jose	32	58	44
Santa Maria	121	278	303
COLORADO			
Alamosa	232	389	494
Colorado Springs	69	77	153
Denver	71	75	138
Grand Junction	35	35	38
Pueblo	28	28	74
CONNECTICUT			
Bridgeport	77	78	88
Hartford	140	157	115
New Haven	118	128	111
DELAWARE			
Wilmington	38	36	47
DIST. OF COLUMBIA			
Washington (CO)	8	8	32
Washington	8	8	37
FLORIDA			
Apalachicola (CO)	0	0	0
Daytona Beach	0	0	0
Fort Myers	0	0	0
Jacksonville (CO)	0	0	0
Jacksonville	0	0	0
Key West (CO)	0	0	0
Miami (CO)	0	0	0
Int. Airport, Hialeah	0	0	0
Miami Beach	0	0	0
Orlando	0	0	0
Pensacola (CO)	0	0	0
Tallahassee	0	0	0
Tampa	0	0	0
West Palm Beach	0	0	0
GEORGIA			
Athens	0	0	5
Atlanta	0	0	8
Augusta	0	0	0
Columbus	0	0	0
Macon	0	0	0
Rome	0	0	8
Savannah	0	0	0
IDAHO			
Boise	145	197	135
Lewiston	131	178	133
Pocatello	181	234	183
ILLINOIS			
Cairo (CO)	3	3	28
Chicago (CO)	28	29	
Chicago	31	31	90
Chicago University	35	37	
Moline	58	80	104
Peoria	38	38	87
Springfield	33	36	89
INDIANA			
Evansville	16	18	59
Ft. Wayne	44	52	124
Indianapolis	30	30	79
South Bend	82	79	119
IOWA			
Burlington	47	47	83
Des Moines	48	51	118
Dubuque	101	111	185
Sioux City	85	86	153
KANSAS			
Concordia (CO)	18	18	55
Dodge City	15	15	40
Goodland	51	52	95
Topeka (CO)	13	13	42
Topeka	13	13	67
Wichita	3	3	32
KENTUCKY			
Lexington	19	19	56
Louisville (CO)	5	5	41
Louisville	13	13	51
Pikeville (CO)	6	6	
LOUISIANA			
Baton Rouge	0	0	0
Lake Charles	0	0	0
New Orleans (CO)	9	9	0
Int. Airport, Moisant	3	3	0
Shreveport	0	0	0
MAINE			
Caribou	381	676	572
Portland	255	361	270
MARYLAND			
Baltimore (CO)	2	2	29
Baltimore	25	25	50
Frederick	38	36	47
MASSACHUSETTS			
Blue Hill Obs.	183	220	
Boston	107	118	84
Nantucket	133	154	167
Pittsfield	246	384	301
MICHIGAN			
Alpena (CO)	205	323	350
Detroit	71	86	104
Detroit (Willow Run)	87	86	106
East Lansing (CO)	84	99	
Escanaba (CO)	255	363	404
Grand Rapids (CO)	85	105	125
Grand Rapids	114	151	187
Marquette (CO)	285	433	392
Muskegon	111	156	226
S. Ste. Marie	322	552	533
MINNESOTA			
Duluth (CO)	328	495	434
Duluth	348	492	445
International Falls	404	586	544
Minneapolis	158	159	182
Rochester	180	200	244
St. Cloud	263	314	310
MISSISSIPPI			
Jackson	0	0	0
Meridian	0	0	0
Vicksburg (CO)	0	0	0
MISSOURI			
Columbia	16	16	88
Kansas City	7	7	44
St. Joseph	21	21	54
St. Louis (CO)	11	13	38
St. Louis	14	18	45
Springfield	11	11	69
MONTANA			
Billings	174	188	222
Glasgow (CO)	252	291	288
Great Falls	280	357	347
Havre (CO)	239	287	328
Helena	285	381	422
Kalispell	356	589	456
Miles City	179	188	204
Missoula	300	459	371
NEBRASKA			
Grand Island	50	53	90
Lincoln (CO)	32	32	86
Norfolk	68	71	139
North Platte	77	79	138
Omaha	36	38	93
Scottsbluff	79	82	137
Valentine (CO)	114	118	166
NEVADA			
Elko	275	373	283
Ely	253	343	294
Las Vegas	0	0	0
Reno	217	309	253
Tonopah	73	90	101
Winnemucca	280	345	197
NEW HAMPSHIRE			
Concord	228	313	260
Mt. Washington	797	2071	
NEW JERSEY			
Atlantic City (CO)	18	18	29
Newark	53	53	47
Trenton (CO)	45	45	55
NEW MEXICO			
Albuquerque	3	3	10
Clayton	31	31	68
Roswell	0	0	8
NEW YORK			
Albany	157	197	163
Binghamton	191	271	271
Buffalo	132	169	168
New York (CO)	44	44	39
La Guardia Field	30	30	28
Rochester	157	203	176
Schenectady	149	173	
Syracuse	138	176	146
NORTH CAROLINA			
Asheville (CO)	14	14	50
Asheville	28	28	
Charlotte	0	0	7
Greensboro	4	4	29
Hatteras (CO)	0	0	0
Raleigh	1	1	16
Wilmington	0	0	0
Winston-Salem	1	1	28
NORTH DAKOTA			
Bismarck	251	291	293
Devils Lake (CO)	331	507	384
Fargo	246	283	281
Grand Forks	296	355	
Pembina	258	288	
Williston (CO)	304	360	332
OHIO			
Akron	79	101	100
Cincinnati (CO)	5	5	42
Cincinnati	27	29	83
Cleveland (CO)	38	40	69
Cleveland	45	50	85
Columbus	33	37	77
Dayton	31	38	79
Sandusky (CO)	28	28	66
Toledo	58	71	114
Youngstown	90	127	102
OKLAHOMA			
Oklahoma City	0	0	14
Tulsa	0	0	18
OREGON			
Astoria	185	562	395
Burns (CO)	259	410	288
Eugene	175	336	211
Meacham	361	729	484
Medford	127	153	77
Pendleton	113	148	104
Portland (CO)	97	182	112
Portland	142	262	163
Roseburg	187	253	
Salem	174	313	157
Sexton Summit	295	664	326
PENNSYLVANIA			
Allentown	86	91	98
Harrisburg	40	40	69
Philadelphia (CO)	18	18	33
Philadelphia	27	27	47
Pittsburgh (CO)	25	26	56
Pittsburgh	54	71	114
Reading (CO)	36	36	62
Scranton (CO)	101	115	133
Williamsport	82	91	117
RHODE ISLAND			
Block Island	94	103	115
Providence	118	137	133
SOUTH CAROLINA			
Charleston (CO)	0	0	0
Charleston	0	0	0
Columbia	0	0	0
Florence	0	0	0
Greenville	0	0	10
Spartanburg	0	0	7
SOUTH DAKOTA			
Huron	112	113	175
Pierre	105	105	
Rapid City	110	111	249
Sioux Falls	117	118	182
TENNESSEE			
Chattanooga	3	3	24
Knoxville	1	1	33
Memphis	0	0	17
Nashville	4	4	22
TEXAS			
Abilene	0	0	5
Amarillo	0	0	37
Austin	0	0	0
Brownsville	0	0	0
Corpus Christi	0	0	0
Dallas	0	0	0
Del Rio	0	0	0
El Paso	0	0	0
Ft. Worth	0	0	0
Galveston (CO)	0	0	0
Galveston	0	0	0
Houston (CO)	0	0	0
Houston	0	0	0
Laredo	0	0	0
Lubbock	0	0	23
Midland	0	0	
TEXAS (Cont'd.)			
Port Arthur	0	0	0
San Angelo	0	0	0
San Antonio	0	0	0
Victoria	0	0	0
Waco	0	0	0
Wichita Falls	0	0	5
UTAH			
Milford	94	96	114
Salt Lake City	93	100	88
VERMONT			
Burlington	224	408	238
VIRGINIA			
Lynchburg	9	9	49
Norfolk	4	4	9
Richmond	5	5	33
Roanoke	14	14	50
WASHINGTON			
Olympia	209	540	381
Seattle (CO)	129	308	228
Seattle	182	469	337
Spokane	226	344	250
Stampede Pass (CO)	484	1304	925
Tatoosh Island (CO)	228	862	898
Walla Walla (CO)	77	89	93
Yakima	168	260	157
WEST VIRGINIA			
Charleston	24	28	80
Elkins	84	118	162
Huntington (CO)	12	12	35
Parkersburg (CO)	24	25	56
WISCONSIN			
Green Bay	204	280	273
La Crosse	129	138	183
Madison (CO)	108	120	177
Madison	122	136	194
Milwaukee	92	113	186
WYOMING			
Casper	113	117	268
Cheyenne	132	157	313
Lander	138	181	274
Sheridan	188	170	307
ALASKA			
Anchorage	490	974	1040
Annette	310	814	838
Barrow	871	2228	2641
Bethel	593	1331	1298
Cordova	465	1202	1233
Fairbanks	663	1134	1057
Juneau	467	1066	1134
Kotzebue	740	1624	1550
McGrath	658	1250	1193
Nome	886	1696	1660
Northway	750	1379	1211
St. Paul	594	1783	1710
Yakutat	469	1245	1257

Data from airport unless otherwise specified.
CO indicates data from city office.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4

SEPTEMBER 1954

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Louisiana, southeastern portion	1-17						Slight		Rains and winds	Squalls which moved around tropical low in Gulf caused heavy rains, high tides, and high winds over southeast portion of State; Highway 11 east of New Orleans flooded for 24 hours.
	1									Minor storm also reported at Springerville, Ariz.
Custer County, Idaho	2				1				Electrical and wind	Young man struck by lightning and killed instantaneously while scaling Mt. Borah. Near Chilly, at Barton Flat, roof blown off house.
Ohio northern portion	2	Evening				1	°$1,042,000		do	News descriptions of storm indicate high percentage of cloud to ground discharges.
Pennsylvania, western portion	2-3	10 p.m.-3 a.m.				2			Electrical	Series of sharp electrical storms swept over area, causing mostly minor damage. In Pittsburgh area, 2 houses struck by lightning which set fires that did $5,000 damage. Spotty tree and wire damage reported from all sections. Near Mercer, lightning struck church belfry and did minor damage to plaster and sideboards; killed 3 heifers. Near Sewickly Heights, lightning struck, and resulting fire destroyed $30,000 home. 1 fireman and 1 lineman injured.
Chautauqua County, N. Y.	2	11 p.m.					17,000		do	Lightning destroyed barn with contents at Sheridan and damaged dwelling at Mayville.
	2									Minor storm also reported near Armstead, Mont.
Denver, Colo.	3	3-4 p.m.	6	*2	1	8	6,000		Rain and electrical	Lightning caused power failures and minor fires. Heavy downpour and runoff caused numerous automobile accidents, resulting in 1 death and 8 injuries. Storm severest from downtown Denver southward.
New England, entire section	3	Evening					25,000		Electrical	Many of these storms locally severe, and, occurring only 3 days after hurricane "Carol", resulted in either halting emergency work on power and phone lines, or in causing additional damage to such installations. Unique occurrence of "blinding flash of white ball of lightning which exploded in middle of street" in Marlboro, Mass.; many eyewitnesses.
	3									Minor storm also reported near Buffalo, Mont.
Fremont, Teton, and Bonneville Counties, Idaho	4	Afternoon							Hail	Hailstones up to ½ inch in diameter did extensive damage to grain in a few places, particularly southeast of Driggs.
Idaho and Lewis Counties, Idaho	4-5							Unknown	Rain	Hard rainstorm night of 4th and on 5th lodged grain and cracked pea pods, resulting in reduced yields.
Puerto Rico	4,5,6	Afternoon of 4th to afternoon of 6th			4		604,000	$25,000	Strong easterly wave	Moderately strong easterly wave which passed over Puerto Rico on 4th showed evidence of becoming tropical storm about 175 miles northwest of Puerto Rico by 5th. Southerly to southwesterly flow of air which followed produced very heavy rains over southern and southwestern portions of Island. By morning of 7th tropical storm had moved to position about 500 miles northwest of Puerto Rico and had developed into hurricane "EDNA". These conditions caused floods of Yaguez, Loco, Jacaguas, Coamo, and Portugués Rivers. Greatest damage from floods occurred at Santa Isabel, Ponce, Juana Diaz, Lajas, Cabo Rojo, and Mayaguez. Majority of people in these towns had to be moved to higher ground. 50 houses destroyed and approximately 500 homes and shops damaged. As result of these floods, roads and bridges suffered losses amounting to $250,000; hydroelectric dams $42,000; homes destroyed $50,000; homes damaged $92,000. Preliminary estimate of loss suffered by sugarcane crop put at $15,000 and that of banana crop at $10,000. Damages to municipal streets and sewer systems estimated at $170,000. 4 persons lost their lives; 3 of these resulted from young men swimming in swollen rivers against advice of authorities.
Hume (5 miles south of), Vernon County, Mo.	4	2 p.m.	1	200	0	0	1,000	0	Tornado	Church moved 18 inches from its foundation. Twister traveled southwestward.
	4									Minor storm also reported near Clearmont, Wyo.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Plymouth, Cherokee, and Buena Vista Counties, Iowa	5	1:30 a.m.	45	*3				$1,650,000	Hail	Very severe hailstorm destroyed crops extending 20 miles from south of LeMars, Plymouth County, to south of Marcus, Cherokee County, picking up again north of Aurelia in Cherokee County, and continuing intermittently for 25 miles to vicinity of Albert City in Buena Vista County. Damage to corn crop estimated $1,500,000, to soybeans $150,000.
Baker-Ekalaka area, Mont.	5	Evening	50	*40		Several	Some	Some	Rain and hail	Rain softened railway bed resulting in wreck of Milwaukee passenger train; several passengers injured.
Kalispell (northwest of), Mont.	5							75,000	Hail	About 4500 acres of crops damaged. Percent of damage varied from 5 percent for wheat to 65 percent for oats.
Peetz, Colo.	5	11:55 p.m.					$10,000		Electrical	Damage from direct hit of power plant by lightning.
Weld, Morgan, and Washington Counties, Colo.	5-7		80	*30			2,000	12,000	Wind, dust, rain, and hail	Dust reduced visibility to zero in some sections. Downpours flooded basements. Hail damaged crops.
	5									Minor storm also reported at Lawver, Wyo.
Campbell (2 miles northeast of), Dunklin County, Mo.	6	12:30 p.m.	½		0	0	2,000	0	Tornado	Small tornado blew down barn and tool sheds.
Crawford, Washington, and Benton Counties, Ark.	6	Afternoon					17,500		Wind and electrical	Barn near Natural Dam struck by lightning and burned to ground. Home and large brooder house near Springdale struck by lightning, with damages estimated at $7,000. Several buildings damaged by wind east of Siloam Springs, with wind damages estimated at $10,000.
Mt. Ida, Montgomery County, Ark.	6	2:15-3:30 p.m.	1½	*1			500		Wind and hail	Most of damage by wind. Maximum size of hailstones 1 inch in diameter.
McLean County, Ky.	6	6 p.m.					5,000	5,000	Electrical	3 barns destroyed by fire after being struck by lightning. Large quantity of hay, tobacco, corn, and farm equipment lost.
	6									Minor storms also reported in Daviess and Hopkins Counties, Ky.; at Tulsa, Okla.; and in Richmond and vicinity, Ind.
Galveston, Galveston County, Tex.	7	A.m.			1				Electrical	Man killed by lightning during local thunderstorm.
New England	7	All day			6	16	°100,000		Electrical, wind, and rain	For second time since hurricane "Carol" series of violent electrical storms undid much repair work of haried power and telephone line crews. Many lightning-started fires caused additional damage. Local wind squalls, especially in Berkshire County, Mass., unusually severe. Excessive rainfall in parts of southern New England caused washouts and minor floods. Fatalities due to lightning strikes or auto accidents brought about by poor visibility and slippery roads in heavy showers.
Columbia, Ulster, and Dutchess Counties, N. Y.	7	Afternoon					4,000	696,500	Hail, wind, and electrical	Series of thunderstorms in eastern New York, caused heavy loss from hail-damaged and wind-blown fruit. Hailstones ranged from ½ to 1 inch in diameter and broke numerous windows. Lightning started many fires, mostly small.
Delaplane (2 miles south of), to Rectortown (1 mile southeast of), Fauquier County, Va.	7	2:15 p.m.	4		0	0			Tornado	Poultry house demolished, several barns partially unroofed, and many trees downed.
Stonewall (3 miles southwest of), Pontotoc County, Okla.	7	3-3:30 p.m.	3-4	200	0	0	55,000	0	do	Damage to outbuildings of Amerada Oil Co. Some damage also to utility lines.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Brownsburg area, Rockbridge County, Va.	7	3:15 p.m.							Thunderstorm	Roofs of homes and barns damaged, trees uprooted, and wires broken.
Stanley area, Page County, Va.	7	3:15-4 p.m.				1	$27,500	$500	Wind, electrical and hail	Winds of possible tornadic character demolished brooder house, temporary school house of cinder block construction, and cinder block half of poultry house, destroying over 6,000 young chickens; also downed trees, wires, and TV antennas. Lightning fired and destroyed barn and 1 person injured when blown from her feet and pelted by hail.
Hazleton-Stroudsburg area, Pa.	7	3:30-6 p.m.							Electrical	Lightning struck along northeast extension of Pennsylvania Turnpike, set off about half of 600 dynamite-filled holes on construction project. In Cherry Valley, lightning damaged utility cable and burned hole in gas pipe. In Stroudsburg 350 telephones knocked out of service for several hours. 1 power transmission line burned out by lightning.
Kent County, Del.	7	P.m.							Electrical and wind	Described as "most violent electric storm in years".
Ohio, northeastern portion	7	Evening					20,000		Thunderstorms with winds	News accounts used the terms "tornado-like winds" and "baby twister" to describe storm. Storm appears to have been squall line which originated near eastern Lake Erie and moved southeastward over 3 or 4 counties.
	7									Minor storm also reported at Colorado Springs, Colo.
	8									Minor storms also reported near Gorham and Russell, and from Kanona to north of Norcatur, Kans.
Maize (3 miles north of), Sedgwick County, Kans.	9	2 a.m.			0	0		0	Tornado	Barn unroofed; trees and power lines downed.
Theodore-Dawes area, Mobile County, Ala.	9	4:15-4:30 p.m.	8	*2			5,000	1,000	Wind and hail	Wind overturned 3 small airplanes and damaged an unfinished hangar. Heavy hail accompanied storm, with average size of stones as large as "marbles" and largest stones size of "bantam eggs".
	9									Minor storm also reported in Davidson County, N. C.
Greenville, S. C.	10	Afternoon				1			Electrical	
Coastal area, N. C.	10	P.m.					75,000	40,000	Hurricane "Edna"	Storm center offshore; damage minor, but widespread. TV aerials, roofs, and piers damaged along most of coastline. Section of outer banks highway washed out. Corn crop damaged 2 or 3 percent over large area.
	10									Minor storm also reported in Tolleson area, Ariz.
New Jersey, shore and adjacent areas	11	3 a.m.-3 p.m.	100	*20	5		$100,000		Hurricane "Edna"	Some damage extending from Cape May County in south to Raritan Bay in north. Losses mostly minor, but totaling considerable sum. Estimate of damage includes estimated amount of damage by flooding of $15,000 in Newark and Elizabeth suburbs from heavy rains. Gale winds and heavy rains (some near 5 inches) as hurricane moved northeasterly, approximately 125 miles off New Jersey shore. Deaths due to traffic accidents, in which storm believed to have been contributing factor.
New England, southeastern and coastal sections	11	Early afternoon to early evening			16	150	°23,600,000		Hurricane "Edna"	Hurricane struck New England a glancing blow. Its center crossed Martha's Vineyard and Cape Cod Bay shortly after 1 p.m. From then until it passed south and east of Eastport, Me., its course was northeastward, offshore and fairly parallel to New England east coast. Thus nearly all of New England (except Cape Cod and Islands to south), being on west or north side of center was spared worst of storm with respect to wind force; highest speeds there came with "Edna's" backlash, in gusts up to 93 m.p.h. in southern Rhode Island and up to 92 m.p.h. over central Maine coast. Gust speeds above 100 m.p.h. recorded at Martha's Vineyard and over outer Cape Cod. Attendant rainfall was of near-record intensity, measuring 4 to 8 inches over coastal areas and southeast. Widespread floods and washouts produced by these excessive rains caused more damage than that produced by winds. Radar reports, in afternoon of 11th, indicated that hurricane had 2 "eyes" about 60 miles apart.

See footnotes at end of table.

Table 4—Continued

SEPTEMBER 1954

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Long Island, N. Y.	11						$500,000	$1,500,000	Hurricane "Edna"	Hurricane winds which attained velocity of 95 m.p.h. at Brookhaven National Laboratory swept Long Island where trees were blown down, numerous buildings unroofed, 50,000 electric services disrupted, and 4,000 telephone services broken. Many small craft sunk or damaged, particularly on North Shore. Highways and railroads washed out in places by high seas while beaches seriously eroded. In Suffolk County, heavy rain washed potato tubers from soil so they were damaged by exposure to sun while other vegetable crops sustained substantial injuries.
Phoenix, Ariz.	11	6:15 p.m.					80,000		Thunderstorm with winds	Gusts reached 58 m.p.h. at Phoenix Airport in advance of approaching thunderstorm. Radio Station tower (KONI) blown over. No other wind damage reported.
	11									Minor storms also reported in McIntosh County, Ga.; and in coastal areas of Maryland and Delaware.
Chester (north of), Mont.	12	4-5 p.m.	20	*½-3				20,000	Hail	Hailstones 1/4 to 1/2 inch in diameter. Damage to wheat and barley.
	12									Minor storm also reported in Chaco Canyon, Idaho.
Sedgwick, Colo.	14	2-4 p.m.	40	*3				100,000	do	Damage mostly to crops from hail. Stones size of marbles to golf balls; ground covered to depth of 2 inches. Storm moved across Sedgwick County to southeast.
Dundy County (central portion), Nebr.	14	3:30-5 p.m.	35	*6			10,000	65,000	do	Stones ½ to 2 inches in diameter. Ground 100 percent covered in center of path. Greatest depth of ground cover, about 2½ inches. Very severe hailstorm, but damage relatively light because principal crop grown in this region, winter wheat, had been harvested. Minor crops destroyed were sudan grass seed, grain sorghums, and corn.
Marked Tree and vicinity, Poinsett County, Ark.	14	Evening	5	*½			12,000		do	Considerable damage to cotton crops on 2 large farms.
Cheyenne County (western portion), Kans.	14	6 p.m.	15	*3			2,500	20,000	Hail and rain	Strip of hail and torrential rain from about 10 miles west of St. Francis southeastward. Hail reported washed into 5-foot drifts and runoff sufficient to raise Republican River to bankfull at St. Francis.
Wichita County (northeastern portion), Kans.	14	9:15 p.m.	24	*1½-5			3,000	4,000	Hail	Average size of hailstones 1-inch, ranging up to 2½ inches in diameter.
Somerset County, Pa.	15	5:30 a.m. 6:30 a.m. and 10 p.m.							Electrical	Lightning struck and fired 3 barns, burning them to ground. One hit near Clymer about 5:30 a.m., no estimate of loss. Second hit near Berlin about 6:30 a.m. with estimated loss of $12,000. Third hit near Somerset about 10 p.m. with estimated loss of $10,000.
Perry, Livingston County, N. Y.	16	4:30 a.m.					10,000		do	2 barns destroyed by lightning.
Sayre, Pa.	16	6:15 a.m.							do	Lightning struck and burned out 100 h.p. motor in city water pumping station.
Buffalo, Erie County, N. Y.	16	Early a.m.					10,000		Hail	Walnut-sized hailstones broke 2,000 panes of glass 16x24 inches in South Park Conservatory and tore its flowers to shreds.
Varysburg, Wyoming County, N. Y.	16	A.m.					10,000		Electrical	Dwelling house burned by lightning.
Latah County, Idaho	16								Hail	Hail fell rather extensively, but no definite reports of damage available.
Allentown-Bethlehem area, Pa.	16	7:30 p.m.							Electrical	Lightning struck control tower at Allentown-Bethlehem-Easton Airport, caused major damage in transformer vault, knocked out all power for about 12 hours.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
	16-17									Minor storm also reported in Boston and vicinity, Mass.
Latah, Lewis, Nez Perce, and Idaho Counties, Idaho	17								Rain and hail	Although hailstones 1/4 to 3/8 inch in diameter reported, principal damage from rain which resulted in lowering of yield and quality of grain and pea crops about to be harvested.
Ft. Pierce, Fla.	18	2 a.m.	Short	Narrow	2	2	$3,500	$0	Tornado	Picked up small house and carried it about 200 feet, completely demolishing it.
Ohio, northeastern third	18	Early a.m.				1	°6,000		Electrical	Hotel, school, and 2 homes damaged by lightning in Cleveland and Akron.
Minnesota, southern portion	18	A.m.					10,000		Electrical and rains	A number of places in scattered localities struck by lightning with damage mostly minor. Barn partly destroyed by fire near Comfrey, Brown County. Heavy rains accompanied storm which was featured by spectacular lightning displays.
Washington, Pa.	18	Noon				2			Electrical	Lightning damaged at least 3 homes, briefly stunned 2 persons.
Coleman and vicinity, Wis.	18	9 p.m.	10	100					Wind and rain	Severe thunderstorm moved into and through Coleman, accompanied by strong winds and heavy rainfall. In Coleman electrical wires knocked down, TV antennas blown over, trees uprooted, and some homes and buildings received structural damage. Corn fields northeast of Coleman flattened by wind; also, some hail damage reported. Several basements in Coleman flooded by heavy rain. Storm moved northeastward. Damage confined to narrow path. Green Bay Weather Bureau observed gusty winds, peak 47 m.p.h.
Leelanau County, Mich.	18	Late evening					°100,000		Wind, hail, and electrical	Buildings, trees, utility lines, and orchards, principally in Centerville and Bingham Townships, damaged or destroyed.
	18-19									Minor storm also reported at Altoona, Pa.
Houghton Lake to Alpena, Mich.	19	10 a.m.-6 p.m.					15,000		Wind	High winds damaged utility lines and blew down trees which damaged several buildings.
Adams Cove, Jefferson County, N. Y.	19	11 a.m.					40,000		Electrical	Barn and contents burned by lightning.
Dayton, Campbell County, Ky.	19						20,000		Wind	Wind ripped section of roof of Boat Club and damaged some equipment.
Jefferson County, Ky.	19-20						40,000		Wind, rain, and electrical	Wind and lightning deadened some 10,000 telephones, and cut off electricity from about 4,000 homes. Score of homes set afire by lightning, and numerous trees felled by lightning or wind. Heavy rain accompanying storm flooded streets and basements. Wind of 57 m.p.h. highest ever recorded in September in Louisville.
Shelby County, Ky.	19-20					1	°15,000		Wind, rain, hail, and electrical	Streets flooded, trees blown down, crops and buildings damaged. Hail and wind damaged crops and buildings. Large stock and tobacco barn and crib struck by lightning and destroyed. Cut tobacco left in field washed away. Damage to power lines widespread.
Moore County, N. C.	19	Afternoon				4			Electrical	4 golfers stunned by lightning.
Franklin County, Vt.	19	Afternoon					10,000	5,000	Wind	Gusts to 80 m.p.h. felled trees and telephone poles, bringing down power and phone lines. Garden crops also damaged rather severely.
Ohio, southern half	19	Afternoon			1				Wind and hail	Extensive squall line developed in central Ohio during early afternoon and moved southeastward to Ohio River. All southern counties reported wind damage. Hail size of "quarters" in Morgan and Perry Counties in southeastern Ohio. The fatality was at Cincinnati where man blown from ladder.
Maryland, central portion	19	P.m.			1				Wind and rain	Scattered wind and water damage.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
St. Louis, Mo.	19	5:30 p.m.	1	1,000		20	$1,000,000		Hail	Injuries by breaking glass. Damage mostly in downtown area and northward. Largest hailstones 1½ inches in diameter.
Sullivan and Bradford Counties, Pa.	19	5:30-6:30 p.m.			0	0			Tornadoes and rain	Tornado with path about 50 yards wide hit-skipped from west to east for about 18 miles from Lincoln Falls through Estella to vicinity of Satterfield. It was followed by heavy rainstorm. 3 farms heavily damaged: tornado picked up barn and spread pieces of it as much as a mile away. Damage to 2 farms estimated $11,100. Cow killed, team of horses injured. Apple orchard ruined. Several other farm buildings, including silo, blown over. Much tree and wire damage resulted, with some roads blocked by debris. Approach of tornado signified by terrifying roar. North section of LeRaysville also struck by twister at about same time. Its path, about a mile in length, varied from 75 to 600 feet in width. It demolished hay barn, ripped off part of house roof, toppled chimney and moved house off its foundation. 2-acre field of buckwheat uprooted and scattered along 3-mile path. New wire fence and posts torn out of ground.
Fort Jackson-Buckton-Hopkinton area, St. Lawrence County, N.Y.	19	6:30 p.m.			0	0	20,000	$0	Tornado	Buildings damaged and demolished, trees uprooted, automobiles damaged and utility lines broken.
Ashland-Mahanoy City, Schuylkill County, Pa.	19	Evening			0	0			Electrical, rain, winds, and tornado	Severe electrical, rain and windstorms hit-skipped across area. Trees and wires downed, many across highways. Asbestos siding ripped from breaker near Millersville. High winds and heavy rains struck Shenandoah; cellars flooded, display windows shattered; trees and wires downed, some across highways; some landslides occurred, blocking some rural roads. Twister reported to have started on western end of Locust Valley, moved southeasterly just south of Locust Valley Lake. Scores of trees (up to 30 inches in diameter) twisted, and/or uprooted. Large steel power line tower twisted and crashed, disrupting main power circuits.
Pittsburgh, Pa.	19	Evening				4			Electrical, rain, and winds	Severe electrical and rain storm swept across city with most damage reported in eastern sections. Lightning damaged 3 homes and a school. Heavy rains produced flash floods in several locations. Wilkinsburg and Turtle Creek had up to 4 feet of water, many others had water headlight-deep. Scores of autos marooned, the occupants forced to wade to safety. Some landslides reported. Basements and some first floors of homes and stores inundated. High winds caused much tree and wire damage. About same time, airliner encountered "extremely turbulent" air at 21,000 feet over western Pennsylvania in which 2 persons were injured and 2 others suffered shock.
Clark County, Ky.	20	2-3 a.m.					°16,000		Electrical	Lightning struck barn, causing fire which destroyed large quantity of crops. Also much damage to telephone and power lines.
Burke, Camden, Iredell and Wake Counties, N. C.	20	11 a.m.-4 p.m.					50,000	10,000	Wind	Squall line produced several local windstorms of sufficient force to damage buildings, trees, and crops.
Wilson and vicinity, N. C.	20	3:43 p.m.	12	50	0	5	100,000	10,000	Tornado	Associated with above squall line. School demolished, 4 pupils and instructor hurt. Other buildings badly damaged, additional structures unroofed or shifted on foundation. Most of damage in city of Wilson, but path extended through southern portion of city and 3 miles east.
Edwards County, Ill.	20						10,000		Wind	Damage to buildings.
Jasper County, Ill.	20						5,000	8,000	Hail and wind	Localized damage by wind and hail in severe thunderstorm activity.
St. Louis, Mo.	20	5 p.m.					500,000		Wind and rain	Water damage by flooding basements and where windows broken previous day by hail.
Osage, Cole, Iron, and St. Francois Counties, Mo.	20					3	55,000		Wind	8 homes and 23 other buildings destroyed; 41 other buildings and 68 homes damaged.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Durant (vicinity of), Byran County, Okla.	20	8-9:30 p.m.	4	1700	0	1	$50,000	$2,000	Tornado and winds	Major damage to Livestock Commission Barn, drive-in theater, and Durant Box Factory. Other damage to trees, television antennas, and utility lines. Some damage to roofs of barns and houses.
	20									Minor storms also reported in vicinity of Welsh, Okla.; in Jackson and Jersey Counties, Ill.; and in Hopkins County, Ky.
Little Rock, Ark.	21	1 a.m.					10,000		Electrical	Storage warehouse struck by lightning, knocking out wall and spilling 15,000 bushels of oats.
New York, western portion	21								Electrical and wind	Winds which attained 60 m.p.h. speeds in gusts tore small boats from moorings in Buffalo Harbor and swept away small summer docks. Trees uprooted and broken to disrupt public utility services. Lightning burned barn at Rushford, with contents valued at $15,000. Other storm damage unestimated.
	21									Minor storms also reported at Hesperia, Mich.; and at Wilmington, Del., and Sparrows Point, Md.
Merritt Island, Fla.	22	3:30 p.m.	Short	90	0	0	0	0	Tornado	Tornado moved in northerly direction and passed very close to Merritt Island Airport.
Hollywood, Fla.	22	5 p.m.	Short	35	0	5	Minor	0	do	Tornado started as a common whirlwind on surface. As it intensified it rose and began moving northeastward. It dipped to ground for short distance, doing minor damage to 5 houses and an automobile. Witnesses said twister lifted the car carried it approximately 100 feet.
Ft. Lauderdale, Fla.	22	5 p.m.			0	0	0	0	Waterspout	Observed northeast of station for very short time.
Florence area, Ariz.	24	Morning					1,300	10,000	Rain	Heavy thundershowers in mountains east of Florence cut main irrigation canal of San Carlos Irrigation District, causing considerable damage to cotton crops and dirt roads above town.
Ft. Lauderdale, Fla.	24	2:20 p.m.			0	0	0	0	Waterspout	Observed southwest of station for very short time.
Dome area, Ariz.	24	4:30 p.m.					45,000		Rain	Heavy thundershower in Muggins Mountains, north of Wellton, caused flash flooding which damaged Lateral D, 1.4 miles east of irrigation system in Dome area.
Bellows Falls, Vt.	25	2 p.m.			1	1			Electrical	Lightning struck tree under which 2 boys had sought shelter. 1 boy killed; the other injured.
Brushy Hill Community, Franklin County, Va.	25	5-6 p.m.	3	*1			25,000	50,000	Wind and hail	22 farms affected. Crop damage principally to tobacco. Farm buildings damaged.
Albuquerque (5 miles south of), N. Mex.	26	5 p.m.	5	*½				5,000	Hail	Principal damage to apples. Hailstones ½ to 1 inch in diameter.
	26									Minor storm also reported at Dilia, Idaho.
Coalmont, Colo.	27						85,000		Electrical	Lightning damaged television antennas and towers, caused 100-ton hay fire, and killed 4 head of cattle.
Hays, Ellis County, Kans.	27	7:30 p.m.	4	*2			20,000		Wind	Several buildings damaged, many windows blown out, and much minor damage.
	27									Minor storm also reported near Ellis, Kans.; and in Alexander County, N. C.
Sedalia (6 miles west of), Mo.	28	P.m.					15,000		Wind	2 hangars and 4 light planes destroyed near Dresden. Roofs torn off some buildings in area including Knobnoster and Hughesville.
Sedgwick and Sumner Counties, Kans.	28	7:30 p.m.			0	0	10,000	0	Wind and tornado	Severe wind in Wichita, Belle Plaine, and Wellington areas damaged barns and sheds. Funnel cloud reported seen 5 miles south of Wichita.
Parsons, Labette County, Kans.	28	Night							Electrical	Warehouse and contents at Kansas Ordnance Plant burned.
	28									Minor storm also reported in Clarksville and vicinity, Ark.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Enid, Kingfisher, Medford, Perry, El Reno, Apache, Hobart, Sentinel, Cushing, Hallett, Tulsa, Ponca City, McAlester, Ada, Cleveland, and Bartlesville, (vicinities of), Okla.	29	Afternoon			0	1			Wind, electrical, and tornadoes	All of the windstorms were part of a line of thunderstorms that moved across Oklahoma. General damage occurred to television antennas, trees, roofs, outbuildings, signboards, utility lines, and windows. Farmer stricken by lightning at Ninnekah. School gymnasium unroofed at Hallett, and revival tent collapsed at Ada. Tornado funnels sighted in several places, including 6 miles south of McAlester, 5 miles southwest of Wynnewood, and north of Seminole.
Oklahoma City, Okla.	29	3:20-3:22 p.m.	1/8	50-100	0	0	$50,000	$0	Tornado	Store building destroyed. 5 adjacent store buildings damaged. Damage to 10 nearby houses. 2 automobiles crushed under debris of store building.
Dallas, Dallas County, Tex.	29	5:20 p.m.			0	0	0	0	do	Funnel cloud sighted by observer at Weather Bureau Airport Station, Dallas. Traveled eastward.
Chico, Wise County, Tex.	29	5:30 p.m.			0	0	1,500	0	do	Barn and chicken house unroofed. Storm moved northward.
Perrin Field (20 miles west of), Cooke County, Tex.	29	6:30 p.m.			0	0	0	0	do	Tornado cloud seen from Perrin Air Force Base operations tower; no evidence of funnel reaching ground.
Whitesboro (near), Grayson County, Tex.	29				0	0			do	3 small twisters reported. blowing shingles from a number of barn roofs, toppling several barns and chicken sheds, and damaging TV antennas.
Mountville, Troup County, Ga.	30					Several			Electrical	Lightning struck tree at school and shocked several children; none seriously hurt.
Sharpsville, Pa.	30	Evening			0	0			Tornado	About a dozen homes wrecked, trees uprooted, utility line poles snapped, barn demolished, 8 cows killed, greenhouse destroyed, 40 fruit trees uprooted, and windows broken, as short-lived tornado swept through town.
Minerva, Ohio	30	9-10 p.m.	4-6	50	1	3	°15,000		do	Tornado associated with line of severe thunderstorms. Sandusky had squall with winds to 60 m.p.h. during afternoon of 30th.

* Miles instead of yards.
° Crop damage included with other property damage.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

SEPTEMBER 1954

There was very little flooding during September. The flooding that did occur resulted from heavy rains that accompanied Hurricane "Edna" in New England.

Record to near-record low stages were reached at several points in the South Atlantic Slope drainage and in the East Gulf of Mexico drainage.

ATLANTIC SLOPE DRAINAGE.--On the 11th, heavy rains from Hurricane "Edna" occurred in most sections of Maine. The heaviest reported was 8.01 inches at the Portland downtown substation. The Kennebec and Penobscot Rivers rose to near flood stage in Augusta and Bangor, but caused only minor flooding on the 13th. A number of small streams in the Portland area went over their banks, causing considerable damage and some deaths. The Chandler River washed out all nine bridges in Pownal Township. The Presumpscot River flooded the S. D. Warren plant in Cumberland Mills, forcing it to close for one week.

This same storm caused minor flooding in the headwater area of the Merrimack Basin between the 11th and 14th. The rainfall averaged 3.5 inches in the area above Concord, N. H., and 6 inches in the area below, with some stations reporting up to 8 inches in the Nashua River drainage. No damage was reported.

Stages and water levels remained abnormally low and general drought conditions prevailed in the Santee River Basin in South Carolina as a result of continued rainfall deficiencies and rising temperatures. Small streams in the area were in many cases practically dry, or with no flow.

A new record-low stage of 1.9 feet below zero was established on the Ocmulgee River at Abbeville, Ga., on the 6th and was repeated again on the 7th and 9th. The previous low stage was -1.7 feet on September 5, 1925. The former record-low stage of 0.6 foot was equaled on the Oconee River at Dublin, Ga., on the 8th. A new record-low stage of -3.0 feet was established on the Altamaha River at Doctortown, Ga. The previous low stage was -2.3 feet on September 27, 1941.

EAST GULF OF MEXICO DRAINAGE.--September was the 9th consecutive month with below-normal precipitation in Georgia and Alabama. Streams were at the lowest stages since 1927. Water supplies were critically low with many smaller streams and wells dried up.

Several streams in this area reached record-low stages during the month. They are as follows:

River	Station	This Month Lowest Stage and Date		Previous Record-Low Stage and Date	
Apalachicola	(Chattahoochee, Fla.	-1.9	30	-1.5	9-24-25
	(Blountstown, Fla.	2.1	30	2.6	9-23-25
Etowa	Cartersville, Ga.	3.0	--	3.85	10-5-40
Cahaba	Marion Junction, Ala.	0.8	15-16	0.95	8-31-54
Alabama	Millers Ferry, Ala.	2.54	29	3.05	10-23-41

Upper Mississippi Basin.--There were no floods in the Upper Mississippi Basin during the month, except for the high water along the lower Des Moines River the first 2 days of the month.

Ohio Basin.--Because of the prolonged dry period the mean monthly flow of the French Broad River of Asheville during the month was the lowest of record since August 1925, according to U. S. Geological Survey records.

Arkansas Basin.--Record-low daily readings were established on the Arkansas River at Tulsa, Okla., and Van Buren, Ark.; and at Perkins, Okla., on the Cimarron River the previous low daily reading was equaled.

Tulsa, Okla., had a record-low daily reading of 2.1 feet and a record-low mean monthly reading of 2.3 feet. The normal mean monthly stage for Tulsa is 5.0 feet. Van Buren, Ark., showed a record-low daily and record-low mean monthly stage of 0.4 foot and 1.0 foot, respectively. The normal mean monthly stage for Van Buren, Ark., is 7.0 feet. Perkins, Okla., had a mean monthly stage of 2.7 feet which is 2.2 feet below normal. The lowest daily reading of 2.2 feet equaled the previous low recorded in August 1954.

Lower Mississippi Basin.--The Mississippi River receded to a stage of -4.0 feet at Vicksburg, Miss., on the 25th. This stage was within 0.25 foot of the all-time low stage for September.

FLOOD STAGE DATA

Table 5

(All dates in September unless otherwise specified)

SEPTEMBER 1954

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE	Ft.			Ft.	
Bakers: Rumney, N. H.	7	11	12	10.2	11
Pemigewasset:					
Woodstock, N. H.	9	11	12	11.4	11
Plymouth, N. H.	11	11	12	15.4	12
Nashua: East Pepperell, Mass.	8	12	14	9.9	13
MISSISSIPPI SYSTEM Upper Mississippi Basin	Ft.			Ft.	
Raccoon: Van Meter, Iowa	13	8-30	1	14.1	8-31
Des Moines:					
Tracy, Iowa	14	8-27	2	14.8	1
Eddyville, Iowa	15	8-30	2	16.3	1
Ottumwa, Iowa	9	8-31	2	9.7	8-31

* Provisional

RADIOSONDE DATA

Average monthly values

Table 20

SEPTEMBER 1954

Standard pressure surface (mb.)	ALBUQUERQUE, N. MEX. (839 MB.)				ATLANTA, GA. (983 MB.)				BISMARCK, N. DAK. (955 MB.)				BOISE, IDAHO (913 MB.)				BROWNSVILLE, TEX. (1012 MB.)				BUFFALO, N. Y. (993 MB.)				BURRWOOD, LA. (1014 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	1,619	22.6	41	29	309	23.8	61	30	505	13.9	72	30	868	17.9	41	30	7	27.2	80	30	221	14.7	86	30	3	27.0	80
1,000	30	52			29	154			30	108			30	78			30	110	27.3	78	30	123			30	127	26.5	77
950	30	519			29	607	25.1	50	30	551	14.2	71	30	530			30	568	24.6	72	30	560	15.0	72	30	585	23.8	69
900	30	1,001			29	1,080	21.7	52	30	1,004	13.6	63	30	994	20.1	31	30	1,038	22.1	65	30	1,014	12.6	70	30	1,051	21.1	63
850	30	1,503			29	1,573	17.8	56	30	1,483	11.2	63	30	1,486	18.1	27	30	1,533	19.4	61	30	1,492	10.2	67	30	1,544	18.2	59
800	30	2,031	21.1	36	29	2,088	14.3	54	30	1,987	8.9	61	30	2,001	14.4	29	30	2,052	16.4	58	30	1,994	7.6	63	30	2,061	15.2	53
750	30	2,590	16.8	41	29	2,635	11.7	44	30	2,528	6.4	58	30	2,545	10.1	31	30	2,605	13.2	54	30	2,534	4.7	61	30	2,608	12.0	50
700	30	3,169	11.9	48	29	3,205	8.3	44	30	3,083	3.5	53	30	3,110	5.5	34	30	3,177	10.1	48	30	3,084	1.7	56	30	3,180	8.8	47
650	30	3,784	6.6	57	29	3,819	4.7	40	30	3,684	- .1	48	30	3,717	.9	35	30	3,794	6.3	44	30	3,684	- 1.4	50	30	3,795	5.7	41
600	30	4,436	1.5	63	26	4,460	1.2		30	4,316	- 4.1	42	30	4,349	- 3.7	31	30	4,442	2.6	42	30	4,312	- 5.1	47	29	4,442	2.1	40
550	30	5,129	- 3.5	62	26	5,157	- 3.0		30	5,000	- 8.2	34	29	5,031	- 8.7	29	30	5,142	- 1.1	35	30	4,994	- 8.9	40	29	5,140	- 2.0	40
500	30	5,879	- 7.7	44	26	5,904	- 7.6		30	5,731	-12.8	30	28	5,759	-13.8		30	5,896	- 5.5	36	30	5,723	-13.6	39	29	5,891	- 6.5	
450	30	6,701	-12.4		26	6,724	-13.1		30	6,536	-18.4		28	6,557	-19.7		30	6,724	-10.6		30	6,524	-19.0		29	6,717	-12.1	
400	29	7,581	-18.8		26	7,602	-19.7		30	7,394	-25.1		27	7,417	-26.1		30	7,612	-16.8		30	7,383	-25.2		29	7,597	-18.3	
350	29	8,562	-25.6		26	8,576	-27.4		28	8,354	-32.4		27	8,369	-33.1		30	8,600	-23.9		30	8,339	-32.2		29	8,580	-25.3	
300	29	9,660	-33.9		25	9,666	-35.9		28	9,422	-40.5		25	9,440	-40.7		30	9,707	-32.3		30	9,410	-39.7		28	9,679	-33.8	
250	29	10,913	-42.8		25	10,907	-45.3		28	10,640	-49.2		24	10,673	-48.2		30	10,967	-42.0		30	10,633	-47.9		28	10,931	-43.3	
200	29	12,386	-52.5		24	12,360	-55.6		28	12,079	-55.1		24	12,124	-52.6		29	12,442	-53.7		28	12,083	-54.5		28	12,398	-53.8	
175	29	13,238	-57.8		22	13,200	-60.2		28	12,928	-56.0		24	12,982	-54.5		29	13,287	-59.9		27	12,934	-56.8		28	13,244	-59.4	
150	29	14,197	-63.6		20	14,148	-64.3		27	13,910	-57.6		24	13,965	-55.8		28	14,235	-66.3		22	13,891	-58.3		28	14,195	-64.8	
125	29	15,300	-68.6		15	15,257	-67.0		26	15,057	-58.7		24	15,118	-58.1		26	15,323	-71.5		16	15,002	-57.8		26	15,293	-69.9	
100	26	16,630	-69.6		13	16,599	-67.4		26	16,454	-59.0		24	16,520	-59.0		19	16,627	-73.6		10	16,432	-58.7		22	16,613	-70.8	
80	24	17,966	-66.0		8	17,959	-63.6		24	17,850	-58.7		23	17,921	-58.3		16	17,945	-68.5		6	17,820	-56.7		20	17,948	-67.4	
60	20	19,735	-60.0		7	19,749	-58.6		23	19,659	-57.1		23	19,735	-57.2		15	19,702	-62.4						19	19,704	-62.2	
50	17	20,874	-57.4		5	20,894	-57.6		22	20,814	-55.9		22	20,896	-55.7		13	20,837	-60.1						18	20,832	-59.8	
40	15	22,288	-54.5						22	22,236	-54.7		20	22,324	-54.0		12	22,231	-57.0						11	22,234	-57.4	
30	9	24,143	-52.2						17	24,078	-52.3		15	24,199	-51.4		10	24,069	-53.6						5	24,045	-54.5	
20									7	26,723	-49.1																	

Standard pressure surface (mb.)	CARIBOU, ME. (991 MB.)				CHARLESTON, S. C. (1015 MB.)				COLUMBIA, MO. (987 MB.)				DODGE CITY, KANS. (923 MB.)				EL PASO, TEX. (881 MB.)				ELY, NEV. (809 MB.)				GLASGOW, MONT. (939 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	29	191	10.2	86	30	13	23.0	88	30	238	22.2	56	30	792	23.6	42	30	1,195	26.3	40	30	1,908	15.1	35	30	648	14.2	66
1,000	29	116	8.7		30	148	24.5	80	30	120			30	84			30	54			30	59			30	110		
950	29	544	10.7	73	30	602	22.4	71	30	575	24.0	46	30	540			30	522			30	516			30	552		
900	29	992	8.0	73	30	1,067	20.0	66	30	1,041	21.3	46	30	1,016	25.0	34	30	1,006			30	989			30	1,008	13.9	56
850	29	1,462	4.9	73	30	1,558	17.3	60	30	1,533	18.0	44	30	1,515	21.9	37	30	1,510	25.8	33	30	1,481			30	1,487	11.1	57
800	29	1,954	2.9	68	30	2,074	14.8	53	30	2,049	14.7	46	30	2,038	18.4	40	30	2,039	21.5	38	30	2,002	17.5	28	30	1,991	8.3	55
750	29	2,483	.5	63	30	2,625	11.3	56	30	2,599	11.3	47	30	2,589	14.4	43	30	2,599	16.6	45	30	2,553	14.5	28	30	2,530	5.2	53
700	29	3,026	- 2.1	56	30	3,190	7.9	45	30	3,165	7.7	44	30	3,166	10.2	43	30	3,176	11.5	53	30	3,128	9.7	32	30	3,081	2.1	49
650	29	3,619	- 4.9	50	30	3,806	4.3	42	29	3,781	4.0	40	30	3,783	5.8	42	30	3,795	6.2	62	30	3,738	4.5	36	30	3,683	- 1.2	43
600	29	4,238	- 7.9	42	29	4,445	1.0		28	4,421	.0	37	30	4,428	1.6	36	30	4,441	1.5	63	30	4,384	- .9	41	30	4,310	- 5.2	40
550	29	4,918	-11.7	36	29	5,147	- 2.9		28	5,115	- 3.8		30	5,122	- 2.7		30	5,141	- 3.0	58	30	5,067	- 6.0	39	30	4,993	- 9.7	39
500	29	5,633	-16.2		29	5,888	- 7.4		28	5,858	- 8.8		30	5,873	- 7.6		30	5,886	- 6.9	39	30	5,812	-10.8	36	30	5,716	-14.9	39
450	29	6,433	-21.5	40	29	6,716	-12.9		28	6,675	-14.7		30	6,693	-13.2		30	6,709	-12.1	35	30	6,620	-16.3		29	6,511	-20.6	33
400	29	7,277	-27.6	37	29	7,588	-19.2		28	7,547	-21.2		30	7,571	-19.9		30	7,591	-18.2		29	7,486	-22.7		29	7,364	-27.1	33
350	29	8,222	-34.9		29	8,565	-26.5		28	8,518	-28.8		30	8,547	-27.2		30	8,574	-25.4		28	8,452	-29.8		29	8,311	-34.8	33
300	29	9,279	-42.3		29	9,659	-34.8		28	9,601	-37.6		30	9,639	-35.3		30	9,674	-33.7		26	9,532	-37.9		29	9,368	-42.7	
250	29	10,490	-49.2		28	10,904	-44.5		28	10,834	-46.8		29	10,883	-44.4		30	10,927	-43.2		26	10,765	-46.0		29	10,574	-50.9	
200	29	11,939	-52.6		27	12,363	-55.2		28	12,282	-55.8		29	12,347	-53.9		29	12,391	-54.0		26	12,225	-53.3		28	12,012	-55.0	
175	29	12,797	-54.0		27	13,205	-60.4		28	13,124	-59.7		27	13,194	-58.4		29	13,236	-59.8		26	13,077	-57.2		27	12,858	-55.2	
150	29	13,783	-55.0		27	14,154	-64.5		28	14,078	-63.3		27	14,152	-63.3		28	14,186	-66.3		26	14,044	-60.7		27	13,838	-55.9	
125	29	14,944	-55.8		25	15,261	-68.4		28	15,191	-65.7		27	15,260	-67.3		27	15,276	-71.6		26	15,170	-63.4		27	14,994	-57.2	
100	28	16,360	-55.7		23	16,601	-67.7		27	16,541	-65.9		26	16,602	-67.3		25	16,587	-72.6		24	16,534	-64.1		26	16,402	-57.7	
80	26	17,782	-56.0		20	17,956	-64.5		24	17,904	-63.2		23	17,952	-64.8		21	17,905	-66.9		22	17,903	-61.5		24	17,806	-57.3	
60	26	19,615	-54.7		16	19,743	-59.5		22	19,692	-59.6		22	19,730	-59.1		21	19,669	-60.5		22	19,699	-58.6		21	19,625	-56.5	
50	21	20,798	-53.6		15	20,888	-57.6		20	20,841	-57.0		21	20,875	-56.3		21	20,812	-57.9		18	20,850	-56.8		20	20,795	-55.6	
40	17	22,238	-52.4		14	22,294	-55.8		15	22,256	-54.2		19	22,291	-54.1		19	22,226	-55.7		15	22,276	-54.6		17	22,216	-54.8	
30	12	24,157	-50.2		9	24,146	-53.2		5	24,109	-51.9		13	24,145	-51.4		13	24,071	-53.0		9	24,136	-52.6		10	24,083	-52.7	

Standard pressure surface (mb.)	GRAND JUNCTION, COLO. (852 MB.)				GREAT FALLS, MONT. (888 MB.)				GREEN BAY, WIS. (990 MB.)				GREENSBORO, N. C. (987 MB.)				HATTERAS, N. C. (1016 MB.)				HILO, T. H. (1013 MB.)				INTERNAT. FALLS, MINN. (972 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	1,474	20.1	48	30	1,128	14.2	57	30	210	14.2	86	30	273	20.0	73	30	3	23.8	82	30	9	26.1	73	30	360	10.7	82
1,000	30	62			30	98			30	121			30	154			30	143	23.4	77	30	124	24.2	72	30	118		
950	30	524			30	548			30	558	15.0	75	30	605	23.2	51	30	595	20.9	70	30	573	20.6	78	30	552	11.7	75
900	30	999			30	1,011			30	1,014	12.7	73	30	1,072	20.1	50	30	1,057	18.8	59	30	1,037	17.1	82	30	1,001	9.0	73
850	30	1,493	20.5	48	30	1,489	13.7	50	30	1,493	10.3	69	30	1,562	16.5	54	30	1,545	16.1	55	30	1,523	14.0	84	30	1,472	6.3	72
800	30	2,017	19.4	38	30	1,997	10.2	53	30	1,995	8.0	62	30	2,075	13.3	51	30	2,058	13.3	49	30	2,034	12.1	74	30	1,967	4.8	61
750	30	2,575	15.1	40	30	2,538	6.5	56	30	2,533	5.9	57	30	2,622	10.3	46	30	2,605	10.4	44	30	2,583	10.6	54	30	2,495	3.2	51
700	30	3,147	10.3	46	30	3,093	2.8	55	30	3,089	3.0	54	30	3,187	7.0	41	30	3,170	7.0	39	30	3,147	8.4	38	30	3,048	.6	46
650	30	3,765	5.3	51	30	3,696	- .9	50	30	3,688	- .6	55	30	3,800	3.5	34	30	3,780	3.3	40	30	3,764	5.6	34	30	3,643	- 2.6	45
600	30	4,407	.3	55	30	4,323	- 5.2	47	30	4,321	- 4.2	53	29	4,441	- .2		30	4,419	- .4	36	30	4,408	2.3		30	4,270	- 6.3	42
550	30	5,101	- 4.6	52	30	5,004	-10.0	47	30	5,002	- 8.5	46	28	5,138	- 3.7		30	5,112	- 4.1		29	5,106	- 1.5		30	4,947	-10.7	41
500	30	5,842	- 9.6	45	30	5,728	-15.1	45	29	5,740	-12.9	42	27	5,879	- 8.4		30	5,855	- 8.5		29	5,860	- 6.2		30	5,672	-15.3	35
450	30	6,658	-15.0	41	30	6,523	-20.9	41	29	6,541	-18.2	40	27	6,700	-13.8		30	6,674	-14.0		29	6,687	-11.4		30	6,464	-20.9	37
400	30	7,527	-21.4		30	7,375	-27.4	42	29	7,405	-24.3	38	27	7,573	-20.2		30	7,548	-20.5		29	7,571	-17.6		30	7,319	-27.1	39
350	30	8,497	-28.6		30	8,320	-35.0	43	29	8,362	-31.7		27	8,548	-27.5		30	8,523	-27.4		29	8,554	-25.4		30	8,266	-34.3	40
300	30	9,582	-36.9		30	9,377	-42.9		29	9,433	-39.8		27	9,637	-35.7		30	9,613	-35.8		29	9,652	-34.2		30	9,326	-42.1	
250	30	10,820	-45.2		30	10,585	-50.1		29	10,653	-48.5		27	10,880	-44.8		30	10,854	-45.4		29	10,899	-44.5		30	10,537	-50.1	
200	30	12,282	-53.4		30	12,023	-54.7		29	12,096	-54.7		26	12,338	-54.3		30	12,308	-55.5		29	12,354	-56.2		30	11,977	-54.1	
175	29	13,133	-57.7		30	12,875	-55.2		29	12,947	-56.0		26	13,184	-58.8		29	13,148	-60.1		29	13,189	-62.1		30	12,832	-54.7	
150	28	14,092	-61.9		30	13,856	-55.8		29	13,922	-58.0		26	14,142	-62.4		29	14,100	-64.0		28	14,127	-67.3		30	13,815	-55.7	
125	28	15,209	-65.4		30	15,015	-56.7		28	15,059	-60.0		26	15,260	-64.6		29	15,208	-66.4		25	15,213	-71.0		30	14,973	-56.7	
100	28	16,564	-65.9		29	16,423	-57.3		25	16,449	-60.0		26	16,619	-65.2		28	16,555	-66.6		23	16,529	-72.2		29	16,382	-57.6	
80	26	17,927	-63.3		27	17,830	-57.6		24	17,838	-59.1		25	17,985	-62.2		24	17,922	-63.2		22	17,848	-69.2		29	17,791	-57.2	
60	25	19,719	-58.7		25	19,642	-56.6		19	19,644	-56.5		24	19,781	-57.9		20	19,711	-59.1		17	19,590	-64.2		29	19,614	-56.3	
50	24	20,870	-56.6		23	20,802	-55.7		17	20,802	-55.4		22	20,938	-55.8		20	20,860	-56.9		16	20,713	-61.5		28	20,777	-55.9	
40	23	22,298	-54.1		18	22,230	-54.9		14	22,226	-53.4		20	22,365	-53.8		19	22,276	-55.3		12	22,106	-59.3		26	22,195	-54.7	
30	21	24,158	-51.6		12	24,105	-52.4		11	24,080	-51.0		18	24,217	-51.5		13	24,128	-52.7		7	23,917	-57.2		22	24,036	-52.5	
20	10	26,793	-49.3		6	26,769	-47.8										6	26,726	-51.2						11	26,639	-50.0	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

SEPTEMBER 1954

Standard pressure surface (mb.)	LAKE CHARLES, LA. (1014 MB.)				LANDER, WYO. (829 MB.)				LAS VEGAS, NEV. (933 MB.)				LITTLE ROCK, ARK. (1006 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	5	24.9	76	30	1,696	17.3	33	30	660	28.8	17	30	79	24.7	55
1,000	30	128	25.8	71	30	55			30	30			30	128	25.6	50
950	30	584	24.2	64	30	510			30	499			30	586	25.2	45
900	30	1,051	21.1	64	30	984			30	977	29.8		30	1,054	21.8	48
850	30	1,544	18.2	64	30	1,480			30	1,482	25.4	20	30	1,547	18.4	47
800	30	2,061	15.4	58	30	2,000	17.7	27	30	2,009	20.7	24	30	2,065	15.6	44
750	30	2,609	12.5	52	30	2,551	13.4	29	30	2,566	15.8	28	30	2,617	12.6	42
700	30	3,183	9.6	47	30	3,122	8.8	34	30	3,142	10.8	32	30	3,185	9.1	40
650	30	3,799	5.8	46	30	3,731	3.8	40	30	3,760	5.9	35	30	3,804	5.5	34
600	29	4,445	2.2	43	30	4,374	-1.3	44	30	4,405	1.4		30	4,445	1.7	
550	29	5,144	-1.7		30	5,058	-6.9	46	29	5,103	-2.8		30	5,146	-2.4	
500	28	5,895	-6.2		30	5,796	-12.2	38	29	5,851	-7.9		29	5,892	-6.8	
450	28	6,723	-11.6		30	6,601	-17.8	37	29	6,671	-13.8		29	6,721	-12.2	
400	28	7,604	-17.8		30	7,464	-24.3		29	7,546	-20.4		28	7,600	-18.6	
350	28	8,587	-25.0		30	8,422	-31.7		29	8,518	-27.9		28	8,580	-26.2	
300	27	9,688	-33.3		29	9,490	-39.9		29	9,607	-35.9		28	9,675	-34.9	
250	26	10,942	-42.9		28	10,711	-48.6		29	10,850	-44.2		28	10,920	-44.4	
200	26	12,411	-53.5		27	12,150	-54.8		29	12,315	-53.8		28	12,382	-54.4	
175	26	13,258	-59.3		27	12,998	-57.2		28	13,160	-58.9		28	13,228	-59.1	
150	26	14,209	-65.1		26	13,964	-59.5		26	14,111	-63.9		28	14,182	-64.1	
125	24	15,304	-70.8		25	15,100	-61.3		20	15,207	-66.9		26	15,293	-68.7	
100	22	16,616	-72.1		24	16,474	-62.4		13	16,545	-68.0		21	16,628	-69.1	
80	22	17,939	-67.9		22	17,849	-60.8		9	17,886	-65.1		19	17,970	-65.7	
60	20	19,691	-62.2		21	19,660	-58.0		8	19,643	-62.0		19	19,741	-60.3	
50	19	20,828	-59.4		20	20,823	-56.1		6	20,779	-58.6		18	20,886	-57.1	
40	17	22,227	-57.1		19	22,244	-54.1		6	22,192	-55.0		17	22,300	-54.8	
30	13	24,067	-54.1		9	24,091	-52.2		5	24,045	-50.6		14	24,151	-52.9	

Standard pressure surface (mb.)	MAZATLAN, MEXICO (1006 MB.)				MEDFORD, ORE. (967 MB.)				MERIDA, MEXICO (1010 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	15	14	28.9		30	401	18.3	55	13	27	26.2	
1,000	15	65	28.4		30	114			13	117	25.7	
950	15	523	24.5		30	559	19.5	45	13	576	24.1	
900	15	995	21.8		30	1,019	16.4	47	13	1,041	21.5	
850	15	1,490	19.2		30	1,502	12.7	53	13	1,535	18.6	
800	15	2,011	16.5		30	2,008	9.0	58	13	2,053	15.5	
750	15	2,569	13.3		30	2,545	6.1	49	13	2,602	12.4	
700	15	3,137	9.8		30	3,102	3.1	40	13	3,176	9.2	
650	15	3,757	5.7		30	3,703	-.4	34	13	3,794	6.0	
600	15	4,399	1.2		30	4,334	-4.2		13	4,440	2.4	
550	14	5,097	-3.1		30	5,017	-8.5		13	5,138	-1.6	
500	13	5,846	-7.0		29	5,754	-13.1		12	5,891	-6.1	
450	13	6,665	-11.8		29	6,552	-18.9		11	6,716	-11.0	
400	11	7,552	-17.0		29	7,414	-25.0		10	7,606	-16.5	
350	10	8,538	-24.2		29	8,370	-32.3		10	8,595	-23.7	
300	8	9,646	-32.5		29	9,438	-40.7		9	9,697	-32.2	
250	5	10,899	-42.2		28	10,656	-48.6		9	10,957	-42.0	
200					28	12,105	-53.0		9	12,425	-54.3	
175					28	12,964	-54.2		8	13,265	-61.2	
150					28	13,946	-56.4		7	14,206	-68.3	
125					28	15,099	-57.9		6	15,283	-72.8	
100					26	16,504	-58.5					
80					21	17,903	-58.4					
60					21	19,713	-57.7					
50					21	20,865	-56.7					
40					20	22,285	-54.7					
30					14	24,104	-52.5					

Standard pressure surface (mb.)	MIAMI, FLA. (1014 MB.)				MIDLAND, TEXAS (916 MB.)				NANTUCKET, MASS. (1015 MB.)				NASHVILLE, TENN. (995 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	4	26.6	82	30	871	26.2	35	30	14	15.2	90	29	177	23.9	58
1,000	30	131	26.1	79	30	82			30	139	16.0	84	29	137		
950	30	588	23.2	79	30	547			30	578	15.4	75	29	588	24.9	43
900	30	1,053	20.3	77	30	1,022	27.1	31	30	1,033	13.2	71	29	1,060	21.4	48
850	30	1,544	17.4	75	30	1,525	23.6	35	30	1,512	11.1	65	29	1,552	17.7	50
800	30	2,060	14.4	72	30	2,051	19.2	41	30	2,017	8.8	54	29	2,067	14.4	53
750	30	2,604	11.4	63	30	2,603	15.0	45	30	2,555	6.4	46	29	2,617	11.2	49
700	30	3,177	8.3	62	30	3,181	10.8	45	30	3,113	4.1	40	29	3,182	7.7	45
650	30	3,792	4.8	62	30	3,800	7.1	38	30	3,714	1.0	39	28	3,788	4.0	37
600	29	4,436	1.2	57	29	4,448	3.1	33	30	4,351	-2.6	39	27	4,432	.6	
550	29	5,130	-2.4	55	29	5,152	-1.1	31	30	5,040	-6.4	38	27	5,124	-3.4	
500	28	5,880	-6.9	53	29	5,902	-5.1		30	5,776	-10.9	37	27	5,871	-8.2	
450	28	6,704	-11.8	52	29	6,734	-10.7		30	6,583	-16.4	34	27	6,690	-13.5	
400	28	7,587	-17.5	47	29	7,617	-17.2		30	7,453	-22.5	39	27	7,566	-19.9	
350	28	8,573	-24.8	42	29	8,604	-24.4		30	8,419	-29.4	38	27	8,541	-27.5	
300	28	9,675	-33.1	38	27	9,707	-32.6		30	9,500	-37.8		27	9,632	-35.7	
250	28	10,929	-43.3		27	10,966	-41.9		30	10,731	-46.8		26	10,875	-44.6	
200	28	12,392	-55.0		26	12,440	-52.5		29	12,189	-54.2		26	12,337	-54.0	
175	28	13,233	-61.3		23	13,291	-57.8		29	13,038	-57.0		26	13,184	-58.6	
150	28	14,174	-67.1		23	14,248	-63.8		28	14,004	-59.7		26	14,143	-62.7	
125	26	15,262	-70.8		21	15,349	-69.4		28	15,139	-61.3		26	15,256	-65.9	
100	21	16,584	-70.5		21	16,671	-70.6		28	16,521	-61.2		23	16,604	-65.9	
80	19	17,915	-66.3		18	18,014	-66.6		26	17,909	-59.6		21	17,961	-63.5	
60	15	19,670	-61.6		18	19,780	-60.5		23	19,724	-56.1		20	19,749	-58.8	
50	13	20,799	-60.0		18	20,922	-57.6		20	20,892	-54.5		20	20,900	-56.1	
40	12	22,195	-57.8		18	22,337	-55.1		19	22,319	-52.9		18	22,323	-54.3	
30	9	24,012	-54.0		14	14,191	-52.5		18	24,188	-51.2		11	24,175	-51.8	

Standard pressure surface (mb.)	NORTH PLATTE, NEBR. (916 MB.)				OAKLAND, CALIF. (1012 MB.)				OKLAHOMA CITY, OKLA. (969 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	849	18.5	65	30	6	17.6	72	30	391	25.4	42
1,000	30	76			30	111	17.1	71	30	110		
950	30	533			30	558	17.3	56	30	570	27.6	34
900	30	995	20.6	50	30	1,012	18.2	32	30	1,042	24.6	36
850	30	1,489	19.7	43	30	1,499	16.3	23	30	1,540	21.0	39
800	30	2,009	16.7	42	30	2,012	13.9		30	2,060	17.0	42
750	30	2,562	13.1	41	30	2,562	10.9		30	2,608	13.1	44
700	30	3,132	9.0	41	30	3,125	7.8		30	3,183	9.8	36
650	29	3,748	4.8	40	30	3,737	4.3		30	3,799	6.1	33
600	29	4,393	.1	42	30	4,378	.0		30	4,445	2.3	
550	29	5,087	-5.0	44	30	5,070	-4.5		30	5,143	-1.6	
500	29	5,826	-10.0	39	30	5,812	-9.6		30	5,895	-6.3	
450	29	6,642	-15.6		30	6,627	-15.6		30	6,722	-12.1	
400	29	7,509	-21.7		30	7,495	-22.2		30	7,600	-18.7	
350	27	8,477	-28.8		30	8,461	-29.9		30	8,580	-25.9	
300	26	9,560	-37.4		29	9,540	-38.2		30	9,676	-34.4	
250	26	10,793	-46.4		29	10,771	-46.3		30	10,926	-43.5	
200	26	12,246	-54.8		29	12,229	-53.5		30	12,391	-53.6	
175	26	13,092	-58.7		29	13,080	-56.7		30	13,238	-58.8	
150	26	14,051	-62.4		29	14,050	-59.7		30	14,191	-64.3	
125	25	15,163	-65.1		29	15,180	-62.5		30	15,292	-68.7	
100	24	16,519	-65.1		29	16,553	-63.4		27	16,625	-68.8	
80	22	17,882	-64.0		28	17,929	-61.8		27	17,969	-65.5	
60	19	19,662	-59.7		26	19,718	-59.4		24	19,747	-59.4	
50	18	20,805	-57.4		26	20,864	-57.4		24	20,894	-57.0	
40	17	22,218	-54.8		24	22,281	-55.3		20	22,315	-54.4	
30	11	24,046	-52.4		18	24,136	-52.4		17	24,167	-52.0	

Standard pressure surface (mb.)	OMAHA, NEBR. (973 MB.)				PHOENIX, ARIZ. (969 MB.)				PITTSBURGH, PA. (976 MB.)				PORTLAND, ME. (1013 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	29	300	20.3	66	29	338	31.7	38	30	382	18.1	71	30	20	12.2	89
1,000	29	109			29	54			30	140			30	127	13.8	78
950	29	558	21.9	53	29	522	32.4	29	30	584	18.3	65	30	561	12.8	72
900	29	1,025	20.4	45	29	1,002	29.0	30	30	1,046	16.6	60	30	1,013	10.3	73
850	29	1,516	18.3	40	29	1,507	24.7	34	30	1,530	13.2	60	30	1,486	8.0	71
800	29	2,033	15.2	39	29	2,034	20.1	39	30	2,037	10.4	56	30	1,985	5.7	61
750	29	2,582	11.8	40	29	2,590	15.5	42	30	2,572	7.2	51	30	2,516	3.6	56
700	29	3,150	8.0	46	29	3,167	10.7	46	30	3,136	4.0	47	30	3,069	1.4	47
650	29	3,762	3.9	48	28	3,785	6.1	43	30	3,738	.7	43	30	3,664	-1.7	46
600	29	4,403	-.5	51	28	4,431	2.1	38	29	4,374	-2.8	44	29	4,293	-5.3	
550	29	5,097	-5.0	45	28	5,133	-2.1		29	5,059	-6.9	45	29	4,970	-9.5	38
500	29	5,836	-9.8		28	5,879	-6.7		29	5,795	-11.5		29	5,702	-13.7	
450	29	6,653	-15.2		28	6,706	-11.9		29	6,597	-17.1		29	6,497	-18.9	34
400	29	7,521	-21.7		28	7,585	-18.3		29	7,468	-23.2		27	7,363	-25.1	
350	29	8,488	-29.3		28	8,567	-25.7		29	8,430	-30.3		25	8,317	-32.5	
300	29	9,569	-37.5		28	9,666	-33.6		29	9,507	-38.1		24	9,392	-40.1	
250	29	10,801	-46.7		28	10,921	-42.7		29	10,734	-47.4		22	10,611	-47.9	
200	29	12,253	-54.8		27	12,397	-53.4		29	12,177	-55.9		18	12,055	-53.8	
175	29	13,098	-58.4		27	13,245	-59.1		29	13,020	-58.4		15	12,905	-55.3	
150	29	14,058	-61.9		27	14,197	-65.0		27	13,978	-61.5		15	13,885	-56.7	
125	29	15,177	-64.5		26	15,297	-69.3		23	15,101	-63.4		15	15,034	-58.6	
100	29	16,538	-64.4		25	16,625	-69.3		19	16,469	-63.7		14	16,421	-59.2	
80	28	17,910	-62.3		24	17,966	-65.5		11	17,807	-61.9		13	17,819	-57.6	
60	23	19,708	-58.3		23	19,740	-59.9		9	19,586	-57.9		12	19,661	-55.3	
50	22	20,856	-56.2		21	20,878	-57.2		8	20,732	-55.4		12	20,827	-54.4	
40	19	22,271	-53.9		20	22,298	-55.0						11	22,261	-52.1	
30	14	24,133	-50.7		17	24,149	-52.0						8	24,127	-50.6	
20	7	26,850	-48.3		6	26,791	-49.0						5	26,783	-48.0	

Standard pressure surface (mb.)	RAPID CITY, S. DAK. (903 MB.)				ST. CLOUD, MINN. (977 MB.)				SAN ANTONIO, TEX. (986 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	966	16.3	47	30	316	12.7	86	30	243	27.9	50
1,000	30	82			30	118			30	114		
950	30	536			30	557	14.2	73	30	573	27.0	51
900	30	999	18.4	43	30	1,008	11.9	70	30	1,048	23.7	56
850	30	1,489	17.3	43	30	1,486	10.7	62	30	1,545	20.1	60
800	30	2,003	14.3	47	30	1,989	8.7	59	30	2,066	16.5	61
750	30	2,546	10.8	46	30	2,527	6.2	55	30	2,614	13.1	57
700	30	3,116	7.0	44	30	3,084	3.2	51	30	3,190	10.0	45
650	30	3,723	2.9	42	30	3,684	-.2	49	30	3,807	6.8	33
600	30	4,364	-1.4	42	30	4,318	-4.1	45	30	4,457	3.3	32
550	30	5,052	-6.4	39	30	4,998	-8.4	39	30	5,162	-.7	30
500	30	5,790	-11.4	35	30	5,731	-13.4	40	30	5,913	-5.2	
450	30	6,596	-17.2		30	6,531	-18.9		30	6,746	-10.5	
400	30	7,462	-23.6		30	7,392	-25.1		30	7,629	-16.9	
350	30	8,423	-30.9		30	8,348	-32.1		29	8,620	-23.8	
300	30	9,497	-39.2		30	9,418	-40.1		29	9,728	-32.3	
250	30	10,720	-48.2		30	10,638	-48.3		29	10,990	-41.7	
200	30	12,164	-55.3		30	12,084	-54.1		28	12,468	-52.6	
175	29	13,013	-57.5		30	12,936	-56.1		28	13,319	-58.4	
150	29	13,982	-59.2		30	13,909	-58.1		27	14,275	-64.9	
125	29	15,118	-61.3		30	15,053	-59.4		27	15,373	-70.2	
100	29	16,498	-62.0		27	16,437	-59.9		23	16,689	-72.1	
80	29	17,880	-60.5		24	17,834	-58.8		18	18,012	-67.7	
60	25	19,678	-58.2		24	19,647	-56.7		16	19,767	-61.4	
50	24	20,829	-56.5		24	20,804	-55.7		16	20,905	-58.9	
40	23	22,246	-54.5		23	22,233	-53.8		14	22,310	-56.7	
30	17	24,114	-52.0		18	24,091	-51.6		11	14,143	-53.6	
20												

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

SEPTEMBER 1954

Standard pressure surface (mb.)	SAN JUAN, P. R. (1013 MB.)				SANTA MARIA, CALIF. (1004 MB.)				S. STE. MARIE, MICH. (989 MB.)				SPOKANE, WASH. (931 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	19	25.7	85	30	71	14.4	84	30	221	11.5	92	30	722	15.4	54
1,000--	30	136	25.3	81	30	105	14.1	83	30	123			30	108		
950----	30	594	22.7	81	30	551	18.9	53	30	553	11.6	77	30	549		
900----	30	1,057	19.8	81	30	1,009	21.1	29	30	1,004	9.2	77	30	1,010	15.2	50
850----	30	1,548	17.0	76	30	1,502	18.9	26	30	1,476	6.9	76	30	1,491	11.6	53
800----	30	2,064	14.5	69	30	2,019	16.0	22	30	1,973	4.8	73	30	1,995	8.2	54
750----	30	2,613	11.7	64	30	2,569	12.9	22	30	2,499	3.1	63	30	2,531	4.4	54
700----	30	3,184	8.7	58	30	3,139	9.4		30	3,054	.3	60	30	3,082	.8	51
650----	30	3,799	5.1	55	30	3,754	6.1		30	3,645	-2.6	50	30	3,676	-3.0	49
600----	30	4,444	1.3	49	29	4,402	2.2		30	4,276	-6.3	47	30	4,303	-7.0	45
550----	30	5,144	-2.7	44	29	5,099	-2.4		30	4,949	-10.4	42	29	4,982	-11.1	40
500----	30	5,890	-7.1	43	29	5,848	-7.5		30	5,678	-15.2		29	5,705	-16.2	37
450----	30	6,717	-12.1	38	29	6,671	-13.3		30	6,471	-20.8		29	6,492	-21.8	35
400----	30	7,597	-18.0	41	29	7,545	-20.1		29	7,331	-26.6		29	7,345	-28.0	
350----	30	8,580	-25.2	41	29	8,519	-27.7		29	8,279	-33.9		29	8,289	-35.4	
300----	30	9,680	-33.7	41	29	9,608	-36.2		28	9,352	-41.3		29	9,344	-43.1	
250----	30	10,931	-43.8		29	10,851	-44.2		26	10,582	-49.1		29	10,552	-50.0	
200----	30	12,391	-55.7		29	12,317	-53.3		19	12,031	-53.9		29	11,996	-53.0	
175----	29	13,229	-62.1		29	13,166	-58.3		17	12,893	-55.1		29	12,854	-53.8	
150----	28	14,170	-67.5		28	14,123	-63.3		15	13,880	-57.0		29	13,841	-54.6	
125----	25	15,255	-72.1		28	15,232	-66.9		9	15,058	-59.0		25	15,010	-56.6	
100----	20	16,563	-71.3		27	16,578	-66.1						17	16,428	-57.8	
80-----	19	17,887	-69.3		26	17,941	-63.4						7	17,826	-57.4	
60-----	13	19,624	-63.8		24	19,726	-59.6									
50-----	11	20,740	-61.8		23	20,872	-57.2									
40-----	10	22,127	-58.5		21	22,289	-55.0									
30-----	9	23,949	-56.1		14	24,148	-52.6									
20-----	6	26,547	-52.3		5	26,808	-48.9									

Standard pressure surface (mb.)	SWAN ISLAND, W. I. (1010 MB.)				TAMPA, FLA. (1015 MB.)				TATOOSH ISLAND, WASH. (1012 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	10	27.3	83	30	9	24.8	89	30	31	14.2	89
1,000--	30	103	26.9	81	30	137	25.1	84	30	136	14.0	85
950----	30	559	23.8	80	30	592	23.2	76	30	573	12.3	76
900----	30	1,027	21.2	76	30	1,059	20.0	74	30	1,020	9.9	72
850----	30	1,521	18.3	72	30	1,552	17.7	73	30	1,493	7.3	71
800----	30	2,039	15.5	68	30	2,068	14.5	72	30	1,989	4.7	68
750----	30	2,593	12.4	64	30	2,619	11.4	71	30	2,522	2.2	60
700----	29	3,161	9.1	61	30	3,186	8.3	66	30	3,068	-.7	55
650----	29	3,780	5.5	60	30	3,802	5.1	58	30	3,661	-4.0	50
600----	29	4,422	1.7	61	30	4,446	1.7	48	29	4,284	-7.6	48
550----	28	5,117	-2.2	55	30	5,148	-2.3	48	29	4,958	-11.6	44
500----	28	5,871	-6.4	52	28	5,895	-6.3	43	29	5,680	-16.4	44
450----	28	6,697	-11.2	49	27	6,726	-11.4	43	29	6,473	-21.9	40
400----	27	7,583	-16.8	44	26	7,606	-17.4	39	28	7,320	-28.2	44
350----	26	8,572	-23.6	37	25	8,592	-24.3		28	8,263	-35.4	42
300----	26	9,680	-31.8		25	9,697	-32.6		28	9,317	-43.6	
250----	25	10,941	-41.9		23	10,952	-42.7		28	10,519	-51.2	
200----	24	12,413	-53.7		22	12,421	-54.5		28	11,963	-52.3	
175----	24	13,258	-60.2		21	13,266	-60.5		28	12,826	-52.6	
150----	20	14,198	-67.2		20	14,217	-65.8		28	13,818	-53.9	
125----	15	15,279	-73.0		20	15,310	-70.6		28	14,984	-55.0	
100----	14	16,577	-73.9		18	16,625	-70.9		28	16,408	-55.0	
80-----	11	17,900	-68.5		15	17,949	-66.9		28	17,833	-55.2	
60-----	10	19,646	-62.7		13	19,712	-61.5		26	19,674	-55.0	
50-----	10	20,777	-59.5		12	20,845	-60.2		26	20,838	-54.9	
40-----	8	22,176	-57.6		11	22,241	-57.5		26	22,266	-54.4	
30-----	5	24,015	-55.0		10	24,066	-53.7		19	24,124	-52.7	
20-----									8	26,754	-52.1	

	VERACRUZ, MEXICO (1009 MB.)				WASHINGTON, D. C. (1007 MB.)			
SURFACE	29	13	27.8	76	30	88	20.0	72
1,000--	29	93	27.2	77	30	147	21.2	66
950----	29	543	24.0	79	30	596	20.7	57
900----	29	1,017	21.2	75	30	1,058	17.7	57
850----	29	1,510	18.0	75	30	1,544	14.6	56
800----	29	2,028	15.0	77	30	2,054	11.3	57
750----	29	2,581	12.0	75	30	2,597	8.1	56
700----	29	3,148	8.9	74	30	3,158	5.3	48
650----	29	3,765	5.6	70	30	3,766	2.3	41
600----	29	4,410	2.2	67	29	4,403	-1.3	36
550----	29	5,110	-1.6	65	29	5,093	-5.2	
500----	29	5,863	-5.5	58	29	5,834	-9.8	33
450----	28	6,695	-10.0	52	28	6,650	-15.6	
400----	27	7,583	-15.5	48	28	7,519	-22.2	
350----	27	8,577	-22.3		28	8,487	-29.2	
300----	27	9,691	-30.7		28	9,569	-37.3	
250----	27	10,959	-40.7		28	10,804	-46.3	
200----	26	12,439	-53.5		28	12,254	-55.3	
175----	25	13,283	-60.3		28	13,100	-58.6	
150----	22	14,222	-67.5		28	14,060	-61.7	
125----	16	15,307	-74.2		28	15,182	-63.7	
100----	6	16,603	-75.1		27	16,547	-63.3	
80-----	6	17,910	-69.3		25	17,919	-61.1	
60-----					23	19,720	-57.3	
50-----					23	20,876	-55.2	
40-----					22	22,308	-53.3	
30-----					20	24,170	-51.0	
20-----					6	26,752	-48.3	

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20 *Air Force Data for May 1954

Standard pressure surface (mb.)	DENVER, COLO. (830 MB.)				FT. WORTH, TEX. (992 MB.)				OGDEN, UTAH (851 MB.)				RANTOUL, ILL. (988 MB.)				ROME, N. Y. (995 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,661	13.6	51	30	178	21.3	68	31	1,450	16.7	38	31	227	13.4	60	29	146	9.0	70
1,000--	31	59			30	102			31	44			31	120			29	111	10.0	
950----	31	511			30	551	19.7	66	31	499			31	558	13.4	56	29	539	10.3	60
900----	31	977			30	1,012	17.1	69	31	965			31	1,008	10.6	57	29	987	7.2	62
850----	31	1,462			30	1,498	14.0	73	31	1,456	17.3	32	31	1,481	7.2	59	29	1,454	3.9	66
800----	31	1,975	12.6	52	30	2,008	11.9	64	31	1,971	14.2	36	31	1,976	3.6	64	29	1,943	.7	71
750----	31	2,516	9.3	54	30	2,555	9.4	57	31	2,511	9.9	38	31	2,504	.4	61	29	2,459	- 2.3	68
700----	31	3,082	5.8	54	30	3,116	6.2	51	31	3,079	5.3	43	30	3,046	- 2.6	57	29	3,003	- 4.9	59
650----	31	3,685	1.1	60	30	3,720	2.2	49	31	3,679	.7	46	30	3,634	- 5.6	56	29	3,584	- 8.1	51
600----	31	4,321	- 3.5	63	30	4,361	- 1.7	45	31	4,316	- 4.2	48	30	4,254	- 9.1	50	29	4,200	-11.4	44
550----	30	5,002	- 8.4	60	30	5,045	- 6.3	41	31	4,993	- 9.2	49	30	4,923	-13.2	44	29	4,860	-15.6	42
500----	30	5,737	-13.9	56	29	5,784	-11.7	37	31	5,725	-14.3	43	29	5,637	-17.9	36	29	5,574	-20.0	39
450----	30	6,532	-19.7	48	29	6,587	-17.5	32	31	6,519	-20.3	38	29	6,421	-23.2		29	6.346	-25.7	42
400----	30	7,391	-26.3	44	29	7,454	-23.6		31	7,375	-26.7	36	29	7,269	-28.9		28	7,179	-32.4	
350----	30	8,342	-33.6		29	8,415	-31.0		31	8,324	-34.1		29	8,211	-35.9		28	8,106	-39.2	
300----	30	9,404	-41.9		28	9,488	-39.4		31	9,384	-42.2		28	9,257	-43.3		27	9,145	-46.4	
250----	29	10,614	-51.3		28	10,711	-49.0		29	10,594	-50.7		28	10,464	-50.6		26	10,322	-52.2	
200----	29	12,034	-59.2		28	12,143	-58.5		29	12,020	-58.3		28	11,897	-56.3		24	11,752	-53.8	
175----	26	12,869	-60.8		28	12,975	-61.4		26	12,850	-59.2		26	12,741	-57.1		24	12,608	-54.3	
150----	22	13,833	-60.5		27	13,928	-63.3		21	13,808	-59.4		20	13,712	-56.7		21	13,603	-54.9	
125----	12	14,954	-59.2		14	15,025	-64.5		13	14,943	-59.1		13	14,848	-56.6		19	14,762	-55.3	
100----	5	16,322	-59.9						11	16,336	-59.5		6	16,190	-55.2		13	16,163	-57.2	
80-----									6	17,741	-57.9						7	17,608	-60.3	

* June data for the above Air Force stations will be included in the October issue of this publication.

Note: All observations scheduled at 0300, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Table 21

SEPTEMBER 1954

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)			* Buffalo, N. Y. (182 m.)			Burlington, Vt. (100 m.)			Charleston, S. C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)			Ely, Nev. (1,910 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	151	3.1	30	223	2.2	29	5	1.7	27	291	1.8	30	321	3.5	28	86	6.5	30	258	2.0	28	230	1.2	30	115	3.3	30	262	2.4	30	142	2.5	30	194	3.4
500	--	---	----	--	---	----	--	---	----	--	---	----	--	---	----	28	88	6.2	30	264	5.2	28	211	3.8	30	111	3.6	30	262	3.1	--	---	----	--	---	----
1,000	30	158	4.1	--	---	----	--	---	----	27	300	1.8	30	318	3.2	25	89	5.2	28	258	7.5	25	242	5.2	29	73	2.1	30	260	4.0	--	---	----	--	---	----
1,500	30	161	3.5	--	---	----	29	345	1.0	21	283	4.6	30	300	2.4	22	88	4.0	28	261	9.1	22	249	8.4	28	20	2.1	30	260	5.2	30	145	2.0	--	---	----
2,000	30	159	3.2	30	208	3.1	28	270	1.8	19	282	5.9	30	256	2.3	18	82	3.0	28	269	10.2	15	259	8.1	24	9	1.9	30	260	6.7	30	157	2.0	30	203	3.4
2,500	29	161	3.1	30	213	3.2	27	269	4.7	19	281	8.3	29	237	3.5	16	78	3.5	27	274	12.6	13	262	9.8	22	13	2.4	28	272	7.0	30	163	2.4	30	217	3.8
3,000	27	164	2.9	30	222	4.0	25	264	7.9	18	285	12.0	28	237	4.9	14	62	3.6	27	275	14.9	10	275	8.8	22	14	2.1	26	288	8.3	30	159	2.4	30	221	3.6
4,000	25	211	1.4	30	236	5.7	23	265	9.3	16	287	13.9	28	244	7.7	12	91	3.5	27	278	18.0				21	342	2.9	23	291	9.2	28	182	3.0	27	225	5.7
5,000	22	201	1.0	28	247	7.0	22	274	11.3	16	284	16.6	27	233	10.0				27	278	20.3				19	313	3.4	18	296	10.7	26	196	2.7	25	235	9.8
6,000	20	249	.6	23	253	7.9	17	270	12.5	15	285	20.1	26	236	12.7				26	275	21.6				17	323	3.6	16	295	12.5	22	225	1.9	24	241	14.9
8,000	17	260	2.6	20	253	10.6				11	292	25.0	20	252	14.7				25	275	27.7				15	297	5.0	13	303	16.1	20	226	3.5	17	254	17.3
10,000	10	300	9.4	18	266	13.2							12	253	15.1				24	281	28.4				10	306	6.3				19	259	4.8	10	262	25.4
12,000				13	270	14.5							10	254	23.6				22	278	27.7										17	279	6.5			
14,000																			20	275	24.9										15	263	4.7			
16,000																			19	274	16.3															

	Grand Junction, Colo. (1,475 m.)			Green Bay, Wis. (210 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Little Rock, Ark. (88 m.)			Medford, Ore. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			Oakland, Calif. (8 m.)			Omaha, Nebr. (306 m.)		
Surface	30	245	1.9	27	256	2.1	30	246	1.3	27	336	1.2	29	76	4.1	30	148	1.5	28	285	1.1	28	106	3.3	29	124	1.7	30	263	0.6	30	273	4.6	30	173	0.8
500	--	---	----	27	255	3.7	30	246	1.4	--	---	----	29	82	5.2	30	154	1.8	28	293	1.2	28	108	4.0	29	120	1.8	30	252	1.0	30	286	3.7	30	191	1.2
1,000	--	---	----	25	262	6.5	30	265	1.7	27	311	1.1	27	85	3.7	30	170	1.4	28	298	1.6	28	108	3.5	29	88	1.5	30	242	1.2	30	300	2.3	29	213	3.6
1,500	30	240	1.7	20	267	9.3	30	285	2.1	27	270	1.9	26	72	2.5	29	184	1.3	28	227	1.1	28	109	3.0	27	67	2.3	29	239	2.2	30	276	2.5	28	229	5.8
2,000	30	220	2.0	14	281	13.0	30	282	2.9	24	255	3.8	24	50	1.7	26	186	.6	28	210	2.0	27	117	2.6	26	57	2.8	28	237	3.6	30	259	2.7	28	243	7.3
2,500	29	230	3.4	12	291	13.0	28	293	4.7	22	263	5.7	18	61	1.7	24	267	.5	26	217	2.9	27	135	2.0	20	55	4.0	27	252	4.0	30	252	3.5	27	250	8.0
3,000	28	219	4.4	10	296	15.5	28	293	5.6	21	272	6.9	17	52	1.0	23	305	1.3	26	229	4.4	27	131	1.4	18	63	3.3	25	263	4.6	30	247	4.9	27	260	9.2
4,000	27	236	6.9				27	297	7.4	16	269	10.5	14	37	1.8	19	294	2.4	24	249	5.5	22	133	.7	12	73	1.9	22	284	4.6	29	254	7.5	21	271	11.0
5,000	25	242	11.1				23	293	6.6	14	274	13.7	11	321	1.9	17	299	4.2	23	255	8.3	15	46	.5	10	37	1.8	21	285	6.5	28	254	9.7	18	273	13.2
6,000	22	249	12.4				20	292	7.2	14	274	14.7				16	302	5.0	23	257	10.1	13	24	1.4				18	292	6.3	28	253	11.9	15	280	15.4
8,000	17	253	15.6				18	281	9.8	10	254	16.7				10	304	8.2	22	259	14.6							16	307	8.0	23	253	19.0	13	286	17.0
10,000	10	258	17.5				15	269	13.2										15	267	15.2							12	293	9.2	11	258	23.2	10	292	21.1
12,000							12	263	13.5										10	258	21.2															

	Phoenix, Ariz. (345 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			** Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (725 m.)			# Washington, D. C. (88 m.)		
Surface	30	178	0.8	30	29	1.7	24	298	2.1	30	112	2.2	30	280	3.2	29	271	1.5	30	253	0.9	30	227	0.8
500	30	183	1.1	--	---	----	24	299	2.5	30	107	3.5	30	283	2.7	29	272	2.0	--	---	----	30	244	2.4
1,000	30	207	1.5	30	29	1.7	19	291	4.8	29	106	3.6	29	272	1.6	29	274	3.7	30	225	.9	30	264	3.7
1,500	30	214	2.1	30	354	.7	16	284	8.0	29	107	3.3	29	263	2.0	29	289	6.2	29	206	1.2	30	275	6.2
2,000	30	219	2.9	28	258	2.4	15	288	12.5	28	110	3.2	29	233	2.8	29	286	8.3	27	218	2.5	30	282	7.8
2,500	30	224	3.0	25	263	5.4	14	291	14.8	24	93	2.8	29	216	3.5	29	286	11.1	25	240	4.1	30	290	9.4
3,000	30	225	3.6	25	270	7.1	11	291	13.6	24	79	2.1	29	215	4.4	29	281	13.3	21	238	4.8	30	290	10.3
4,000	28	222	5.2	21	277	11.8	10	294	18.7	19	60	1.9	29	231	4.8	28	293	16.0	16	240	5.0	30	280	12.0
5,000	27	227	5.8	20	283	13.1				17	67	1.5	27	241	5.1	28	289	17.7	15	256	7.8	30	285	14.2
6,000	27	238	6.4	19	279	14.3				14	94	1.1	27	241	5.0	28	288	19.2	13	252	11.3	30	282	16.3
8,000	23	245	9.3	14	270	15.0							27	249	9.3	28	287	23.6				30	274	18.3
10,000	15	249	12.1										25	248	14.1	28	286	30.3				30	271	19.5
12,000													23	248	17.3	28	284	34.8				30	273	22.4
14,000													12	249	18.2	27	278	25.9				29	273	20.3
16,000																24	285	20.2				29	273	15.1

* Rawin Data (Cont'd.)
18,000 m., 18 obs., 275 dir., 9.6 speed
20,000 m., 16 obs., 268 dir., 6.8 speed
22,000 m., 15 obs., 267 dir., 5.5 speed

** Rawin Data (Cont'd.)
18,000 m., 21 obs., 291 dir., 11.3 speed
20,000 m., 17 obs., 289 dir., 7.9 speed
22,000 m., 10 obs., 258 dir., 4.8 speed

Rawin Data (Cont'd.)
18,000 m., 27 obs., 276 dir., 7.0 speed
20,000 m., 23 obs., 263 dir., 3.4 speed
22,000 m., 20 obs., 248 dir., 2.2 speed
24,000 m., 18 obs., 49 dir., 2.1 speed
26,000 m., 12 obs., 67 dir., 2.8 speed

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

RAWIN DATA

Average monthly resultant winds

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Buffalo, N. Y. (182 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S. C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N. C. (275 m.)			Hatteras, N. C. (3 m.)			Int. Falls, Minn. (358 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	120	1.9	30	57	2.2	30	82	2.5	30	219	0.5	30	109	3.4	29	242	2.7	30	85	0.9	30	135	1.5	30	85	1.3	30	192	0.5	29	176	1.7	30	321	0.6
500	--	---	----	--	---	----	30	96	6.4	30	239	3.7	28	92	4.2	29	258	5.0	30	133	4.1	30	165	3.1	--	---	----	30	200	2.2	27	192	1.7	30	281	.5
1,000	--	---	----	29	14	1.7	30	90	5.8	29	268	7.7	28	88	5.5	29	258	5.6	30	116	2.9	30	215	4.9	--	---	----	30	240	2.2	27	228	1.5	30	273	2.6
1,500	--	---	----	29	290	3.2	30	82	4.7	29	273	10.2	28	79	6.5	29	260	6.6	30	82	1.7	30	233	5.3	30	90	1.2	30	280	2.6	27	246	1.3	30	284	4.3
2,000	30	200	2.2	29	283	5.0	30	79	4.4	29	276	11.7	27	84	5.4	28	272	7.9	30	81	2.1	30	248	5.3	30	186	2.5	30	293	3.1	28	288	1.7	30	295	5.6
2,500	30	229	3.0	28	275	6.9	30	79	4.1	29	278	13.2	27	83	5.0	28	269	8.6	30	64	1.9	30	266	5.5	30	202	4.6	30	297	3.5	28	290	2.5	29	291	6.4
3,000	30	236	3.8	28	280	8.6	30	84	5.0	29	280	14.2	26	86	4.2	28	270	9.5	30	35	1.5	30	277	6.1	30	215	4.7	30	301	4.2	29	294	3.3	29	291	9.0
4,000	30	245	5.4	27	280	11.9	30	84	5.0	30	283	16.6	25	84	3.4	27	268	12.0	29	360	1.4	28	293	8.1	29	239	6.8	30	290	5.4	29	282	3.9	28	287	11.3
5,000	30	257	6.9	25	281	14.4	30	84	4.3	30	285	18.4	25	69	2.7	25	265	13.0	29	323	1.9	28	295	9.0	29	247	8.6	26	282	7.1	28	280	5.9	26	293	12.2
6,000	30	259	7.9	23	280	16.2	30	89	3.9	30	285	20.3	25	38	1.8	24	265	14.8	29	312	3.2	28	291	10.5	29	249	11.1	26	287	7.9	27	286	6.9	23	291	13.9
8,000	29	249	11.0	18	279	18.3	30	60	2.1	30	281	25.1	25	287	1.6	23	264	18.7	27	277	5.8	28	286	14.7	22	255	11.0	23	290	10.1	26	276	10.6	17	289	15.5
10,000	24	265	12.4	16	263	24.7	30	285	2.9	29	283	28.5	25	300	4.1	12	282	17.8	26	261	12.2	27	283	17.2	19	258	17.1	23	280	13.6	23	284	13.4	12	275	17.4
12,000	21	280	14.2				29	283	3.2	27	281	29.9	25	296	8.2	10	293	21.7	27	268	16.1	27	291	20.8	15	261	21.5	20	277	16.3	23	279	19.3			
14,000	18	272	11.0				27	292	.7	20	270	23.4	23	306	6.5				27	285	12.1	26	290	18.8				14	282	12.9	21	292	15.1			
16,000	18	260	6.1				20	68	4.8				21	354	3.9				22	285	4.8	24	285	12.3				10	268	7.3	20	295	9.3			
18,000	13	352	3.1				14	68	4.9				15	62	3.4				19	65	.8	18	288	5.5							17	330	2.8			
20,000							12	89	12.4				14	81	8.2				15	88	4.6	13	308	1.9							15	99	1.6			
22,000							11	86	14.5										13	81	7.6	10	267	.8							15	105	2.6			
24,000																															11	90	6.7			

Altitude (meters) m.s.l.	Little Rock, Ark. (80 m.)			Medford, Ore. (401 m.)			Miami, Fla. (12 m.)			Midland, Tex. (871 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			St. Cloud, Minn. (318 m.)			San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)		
Surface	30	143	1.1	30	321	1.2	30	85	1.4	30	133	2.1	29	251	2.1	29	222	0.1	30	275	3.1	30	143	3.3	30	23	1.7	30	78	0.5	30	140	2.7	30	118	2.8
500	30	162	4.4	30	317	2.1	30	108	4.6	--	---	----	28	262	6.4	27	199	1.3	30	290	4.3	30	150	4.9	--	---	----	30	165	.5	30	128	6.3	30	104	8.0
1,000	30	177	4.1	30	321	3.5	30	111	4.1	30	134	4.5	28	270	7.5	27	220	2.8	30	281	3.4	30	172	6.2	30	25	1.8	30	244	2.3	30	128	6.3	30	105	8.7
1,500	30	196	3.2	29	302	2.2	30	118	3.3	30	149	8.2	28	269	9.1	27	233	3.5	30	262	2.2	30	179	4.6	30	53	1.0	30	282	4.9	30	116	4.7	30	106	8.1
2,000	29	220	1.6	29	238	1.6	30	114	3.1	30	147	6.9	28	272	10.3	28	226	4.4	30	262	2.4	30	202	3.5	30	254	1.9	30	285	7.2	30	96	3.4	30	106	8.4
2,500	28	216	.8	29	229	2.8	30	112	3.1	30	154	4.7	28	275	12.7	28	238	4.2	30	266	3.0	30	234	3.6	30	245	3.6	29	286	7.8	30	80	3.4	30	102	7.1
3,000	28	254	.8	29	234	3.8	30	111	3.0	30	147	2.5	28	264	13.6	28	253	4.0	30	262	3.8	30	259	3.2	30	259	6.7	29	280	9.6	30	66	2.9	30	105	6.0
4,000	26	328	2.7	30	245	6.5	30	121	2.1	30	37	1.2	25	269	12.8	27	286	4.9	30	255	6.2	30	279	3.7	30	275	12.2	29	286	12.9	30	83	2.6	29	107	5.1
5,000	25	322	2.7	30	254	8.1	29	128	2.5	29	302	1.0	23	273	15.5	26	294	6.2	30	255	9.3	30	276	4.9	29	267	14.1	29	290	15.3	30	69	2.6	29	111	4.8
6,000	24	300	4.8	29	249	12.0	28	96	2.2	29	222	1.4	20	275	15.5	25	301	7.7	30	251	12.2	30	278	6.0	29	266	15.0	26	289	17.4	30	71	2.8	29	102	4.4
8,000	23	295	7.5	27	248	14.5	28	106	1.0	28	252	3.2	16	281	23.0	25	305	10.9	26	253	15.6	29	274	9.3	26	265	16.4	22	284	19.6	28	61	3.2	28	100	2.3
10,000	23	289	11.2	23	252	16.7	28	313	2.5	26	267	4.5				24	300	13.5	21	253	17.9	28	284	11.2	22	267	22.9	19	281	24.8	27	338	2.0	28	42	.8
12,000	20	287	12.4	17	241	19.5	27	322	6.5	24	264	7.8				21	289	17.7	17	247	22.4	28	293	13.2	17	272	28.4	12	276	24.4	26	308	4.4	28	15	2.4
14,000	19	295	12.3	12	249	18.3	27	328	5.0	21	270	6.0				20	290	17.1	11	253	18.4	28	289	14.1	10	261	25.5	11	285	21.7	26	306	3.1	27	355	5.3
16,000	15	297	8.1				19	55	4.3	18	248	3.9				17	296	10.5				27	275	8.5				10	284	12.8	23	86	1.4	22	62	3.6
18,000							15	82	8.7	14	317	1.9				11	293	3.9				24	304	2.9				11	297	2.8	15	52	3.3	17	85	10.4
20,000							11	86	12.2	13	58	5.2				11	14	2.1				22	49	2.6							13	82	6.8	11	94	17.3
22,000										13	90	7.3				11	75	4.6				18	79	5.3							11	86	9.9			
24,000										11	76	10.1										13	93	9.0												

Altitude (meters) m.s.l.	Santa Maria, Calif. (72 m.)			Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is., Wash. (33 m.)			Washington, D. C. (88 m.)		
Surface	29	258	2.4	30	14	0.5	30	196	0.8	30	213	1.5	30	157	0.7
500	28	331	3.1	30	300	1.1	--	---	----	30	234	1.9	30	265	3.0
1,000	28	344	3.6	30	283	3.7	30	206	.6	29	221	2.1	30	282	5.9
1,500	28	14	2.8	30	288	4.9	30	222	1.4	29	222	2.2	30	287	6.8
2,000	29	11	1.1	29	288	6.4	30	228	2.3	29	235	2.9	30	282	6.7
2,500	29	283	1.5	29	287	8.2	30	247	3.5	29	257	3.4	30	283	8.4
3,000	29	276	3.4	29	285	10.4	30	247	4.8	29	259	3.6	30	282	9.7
4,000	28	262	5.4	29	294	14.6	30	247	6.8	28	273	4.6	29	280	10.8
5,000	28	259	7.7	29	298	17.2	29	249	8.9	28	270	5.3	29	282	12.6
6,000	28	257	9.4	29	296	18.0	29	246	10.8	26	264	5.9	28	278	14.8
8,000	27	251	13.3	29	294	22.9	29	248	12.8	22	285	4.7	28	275	18.0
10,000	25	255	16.8	26	291	31.1	29	248	15.8	17	248	5.1	28	270	20.6
12,000	23	247	21.0	19	294	34.0	29	250	19.8	15	251	10.4	28	275	24.0
14,000	19	246	17.2	12	292	24.8	29	254	17.4	14	254	9.3	28	273	22.9
16,000	17	241	8.7				17	273	12.7	14	259	9.8	27	277	13.2
18,000	17	28	.8							14	268	7.5	25	267	8.1
20,000	16	57	3.7							13	279	3.9	23	262	1.3
22,000	14	79	7.8							13	305	4.7	22	152	.7
24,000										10	310	2.8	20	131	1.9

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following Table 22 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

RAWIN DATA

Average monthly resultant winds

Table 22 *Air Force Data for May 1954

Altitude (meters) m.s.l.	Denver, Colo. (1,661 m.)			Ft. Worth, Tex. (178 m.)			Ogden, Utah (1,450 m.)			Rantoul, Ill. (227 m.)			Rome, N. Y. (146 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface----------	30	101	1.2	30	108	1.3	31	44	1.7	30	75	0.5	31	342	0.9
500-------------	--	---	----	30	131	4.6	--	---	----	29	267	1.6	31	301	3.0
1,000------------	--	---	----	30	147	5.3	--	---	----	29	276	3.6	31	292	4.6
1,500------------	--	---	----	30	180	4.2	29	51	1.4	28	272	5.3	30	295	5.0
2,000------------	28	123	2.2	30	212	4.0	28	301	.9	28	269	6.5	29	290	5.3
2,500------------	28	111	1.4	30	247	3.7	28	282	2.1	29	277	7.3	28	278	5.9
3,000------------	28	239	1.2	29	273	4.6	28	285	4.2	28	283	9.0	28	280	6.4
4,000------------	27	265	5.2	29	289	6.1	29	282	6.6	28	288	10.8	28	265	7.1
5,000------------	27	290	9.0	28	286	8.2	30	273	8.3	29	287	13.2	28	269	8.1
6,000------------	29	294	10.8	28	280	9.0	30	284	10.0	28	289	15.3	28	267	9.6
8,000------------	30	299	12.2	29	272	11.8	28	285	11.6	29	284	19.8	27	261	14.1
10,000-----------	29	295	13.2	28	280	15.5	27	282	12.5	28	279	21.9	24	254	16.2
12,000-----------	27	297	15.8	28	274	19.9	25	286	16.1	28	273	21.5	21	261	13.7
14,000-----------	21	291	12.9	26	282	18.7	17	289	12.2	19	290	16.3	18	264	11.9
16,000-----------													11	271	8.3

* June data for the above Air Force stations will be included in the October issue of this publication.

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°,E = 90°,S = 180°,W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following Table 22 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun. SEPTEMBER 1954

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
LINCOLN, NEBR.									
	Air mass								
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77
Sept.									
1	----	----	----	0.99	1.20	0.94	0.75	0.58	0.47
4	----	----	----	----	1.18	.94	----	----	----
7	----	----	----	----	1.34	1.12	----	----	----
10	----	0.85	0.96	1.12	1.34	1.12	.88	.73	.62
11	----	----	----	----	1.30	1.01	----	----	----
15	----	----	----	----	1.16	.92	.75	.60	.48
17	----	----	----	----	----	.90	----	----	----
18	----	----	----	.99	1.21	1.01	.86	.77	.69
21	----	----	----	1.22	1.42	1.24	1.09	.94	.81
22	0.77	.88	1.01	1.18	1.34	1.17	.97	.84	.73
23	.56	.68	.83	1.05	1.25	----	----	----	----
29	.62	.75	.83	----	----	----	----	----	----
Averages	.65	.79	.91	1.09	1.27	1.04	.88	.74	.63
Departures	-.08	-.05	-.05	-.04	-.10	-.09	-.08	-.08	-.08
ALBUQUERQUE, N. MEX.									
	Air mass								
	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0
Sept.									
1	0.76	0.87	0.95	1.14	----	1.16	0.98	0.85	0.76
2	.79	.89	1.01	1.15	1.42	1.16	.97	.91	.78
3	.76	.85	1.00	1.14	1.35	----	----	----	----
4	.78	.89	.98	1.10	1.39	1.19	----	----	----
5	.75	.85	.95	1.11	1.30	----	----	----	----
6	.73	.86	.98	----	----	1.22	----	----	----
7	.81	.89	----	1.16	1.37	1.16	----	----	----
9	.56	.69	.81	.77	----	----	----	----	----
10	.56	.68	.84	1.00	1.23	----	----	----	----
11	----	----	.73	.96	----	----	----	----	----
12	.64	.72	.86	----	----	----	----	----	----
13	.87	.96	1.07	1.24	1.45	----	----	----	----
14	.77	.88	1.01	1.18	1.37	1.14	.94	.78	.67
15	----	----	----	----	----	----	----	.81	----
16	----	----	.96	1.15	1.40	----	.95	----	----
17	.83	.93	1.04	1.19	1.42	1.19	1.03	.90	.74
18	.83	.95	1.07	1.21	1.40	1.28	1.14	1.03	.93
19	.90	1.01	1.12	1.26	1.49	1.21	1.08	.99	.90
20	.95	1.05	1.16	1.30	1.49	1.30	1.14	1.02	.92
21	.51	.70	.89	1.05	1.35	1.03	.85	.63	.49
22	.33	.47	.63	.83	1.25	.95	.77	.63	.52
27	----	.84	.96	1.13	1.38	1.06	----	----	----
28	.86	.96	1.06	1.22	1.47	1.23	----	.95	.86
29	----	----	----	1.19	----	----	----	.72	.60
30	.90	1.01	1.11	1.25	----	1.27	1.10	.98	.86
Averages	.74	.85	.96	1.13	1.38	1.17	1.00	.86	.75
Departures	-.09	-.10	-.09	-.11	-.09	-.09	-.10	-.12	-.14

* Extrapolated

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
BLUE HILL, MASS.									
	Air mass								
	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86
Sept.									
14	----	----	----	----	----	1.27	1.13	1.04	0.97
22	----	0.80	1.00	1.20	----	----	----	----	----
23	----	----	1.00	1.18	----	----	----	----	----
24	0.76	.91	1.06	1.24	----	1.26	1.11	.91	.76
27	----	----	1.01	1.18	----	----	----	----	----
28	----	----	----	.94	----	1.05	.89	.77	.70
29	----	.51	.70	.93	----	1.07	.79	.70	----
Averages	.76	.74	.95	1.11	----	1.16	.98	.86	.81
Departures	-.01	-.13	-.05	-.02	----	.03	.04	.05	.12
WASHINGTON, D. C. (WBCO)									
	Air mass								
	4.95	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.95
Sept.									
1	----	----	0.96	1.16	----	1.03	----	----	----
2	----	----	----	1.01	----	1.00	0.86	0.74	0.55
13	----	----	.94	1.06	----	----	----	----	----
22	----	0.89	1.01	1.24	----	----	----	----	----
23	0.80	.92	1.09	1.25	----	1.20	1.07	----	.84
24	.64	.78	.91	1.14	----	1.17	1.00	----	.64
Averages	.72	.86	.98	1.14	----	1.10	.98	.74	.68
MADISON, WIS.									
	Air mass								
	4.81	3.84	2.88	1.92	*1.0	1.92	2.88	3.84	4.81
Sept.									
2	0.63	0.75	0.91	1.12	1.50	1.20	1.02	0.89	0.76
11	----	----	----	1.22	1.45	1.19	.98	.84	.73
18	----	----	----	1.30	1.40	----	1.12	----	----
20	----	----	1.04	----	----	----	----	----	----
22	----	----	1.11	1.30	1.53	1.31	1.14	1.01	.90
23	.84	.94	----	1.23	1.41	----	----	----	----
25	.95	1.05	1.16	1.30	1.48	1.21	1.04	.87	.76
26	.88	.99	1.11	1.29	1.44	1.29	1.11	.98	.86
27	.73	.84	.98	1.15	1.40	1.09	.89	.75	.62
Averages	.81	.91	1.05	1.24	1.45	1.22	1.04	.89	.77
TABLE MOUNTAIN, CALIF.									
	Air mass								
	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76
	NO DATA DURING SEPTEMBER 1954								

Langley is the unit used to denote one gram calorie per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

SOLAR RADIATION DATA

Table 31a Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date-----------	3	4	5	6	7	8	9		10	11	12	13	14	15	16		17	18	19	20	21	22	23	
Langleys-------	---	---	108	105	40	71	87	82	77	14	---	---	72	87	53	60	38	93	74	86	63	93	96	77
Date-----------	24	25	26	27	28	29	30																	
Langleys-------	82	95	85	93	79	79	74	84																

Table 31b Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date-----------	3	4	5	6	7	8	9		10	11	12	13	14	15	16		17	18	19	20	21	22	23	
Langleys-------	---	---	284	270	57	69	106	157	70	13	---	---	67	85	57	58	36	97	133	171	109	321	340	172
Date-----------	24	25	26	27	28	29	30																	
Langleys-------	324	119	275	307	331	257	75	227																

Table 31c Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date-----------	3	4	5	6	7	8	9		10	11	12	13	14	15	16		17	18	19	20	21	22	23	
Langleys-------	---	---	280	367	47	65	166	185	71	10	---	---	163	210	49	101	36	227	124	143	67	428	457	212
Date-----------	24	25	26	27	28	29	30																	
Langleys-------	497	169	424	398	429	441	81	349																

Table 31d Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date-----------	3	4	5	6	7	8	9		10	11	12	13	14	15	16		17	18	19	20	21	22	23	
Langleys-------	---	---	293	301	45	74	276	198	75	12	---	---	321	271	57	147	40	242	72	108	64	309	344	169
Date-----------	24	25	26	27	28	29	30																	
Langleys-------	323	126	191	295	298	285	89	229																

Table 31e Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date-----------	3	4	5	6	7	8	9		10	11	12	13	14	15	16		17	18	19	20	21	22	23	
Langleys-------	---	---	205	144	79	119	125	134	99	14	---	---	96	130	76	83	46	174	145	154	85	90	113	115
Date-----------	24	25	26	27	28	29	30																	
Langleys-------	36	173	88	101	69	76	102	92																

Note: Langley is the unit used to denote one gram calorie per square centimeter.

Sept. 3-4 Power failure due hurricane Carol
Sept. 12-13 Power failure due hurricane Edna

SOLAR RADIATION DATA

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys. SEPTEMBER 1954

1954	Aklavik, Mackenzie	Albuquerque, N.Mex.	Annette, Alaska	Astoria, Oreg.	Atlanta, Ga.	Barrow, Alaska	Bethel, Alaska	Bismark, N. Dak.	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Tex.
Sept. 3-----	---	614	426	459	602	113	196	193	---	525	300	627
Sept. 4-----	252	656	387	357	571	209	179	483	---	486	445	313
Sept. 5-----	292	645	198	222	536	161	---	426	365	575	---	355
Sept. 6-----	323	664	78	402	555	149	156	552	469	535	---	381
Sept. 7-----	178	626	103	173	581	147	191	545	105	362	134	448
Sept. 8-----	145	492	348	357	400	(102)	158	51	123	544	123	346
Sept. 9-----	148	549	349	243	304	129	---	368	225	534	251	485
Averages-----	226	607	270	316	507	(144)	176	374	257	509	251	422
Departures---	---	---	---	---	---	---	---	---	-135	---	-122	---
Sept. 10-----	112	590	480	167	484	97	190	537	112	527	113	553
Sept. 11-----	184	549	469	115	582	179	143	512	21	525	25	565
Sept. 12-----	314	395	169	306	580	196	122	220	459	507	552	529
Sept. 13-----	245	648	84	309	449	210	98	40	406	535	487	481
Sept. 14-----	315	633	343	245	524	126	(80)	(173)	188	515	216	565
Sept. 15-----	177	618	449	251	303	93	50	256	244	138	313	(638)
Sept. 16-----	143	609	449	157	240	84	98	(84)	92	492	89	602
Averages-----	213	577	349	221	452	149	(112)	(260)	217	463	257	(562)
Departures---	---	---	---	---	---	---	---	---	-143	---	-76	---
Sept. 17-----	55	621	152	288	240	104	111	(147)	55	344	61	385
Sept. 18-----	135	631	265	230	542	69	81	(384)	230	507	267	603
Sept. 19-----	111	628	256	262	434	62	137	458	161	501	---	600
Sept. 20-----	125	629	51	448	407	(67)	369	---	179	496	180	524
Sept. 21-----	268	596	42	168	373	85	339	560	110	451	126	533
Sept. 22-----	140	575	158	290	578	82	257	527	407	358	358	318
Sept. 23-----	93	336	57	285	557	82	239	314	415	452	---	273
Averages-----	132	574	140	282	447	(77)	219	(398)	222	444	198	462
Departures---	---	---	---	---	---	---	---	---	-120	---	-97	---
Sept. 24-----	55	439	133	431	555	188	331	534	468	445	469	509
Sept. 25-----	109	257	251	427	470	116	248	435	214	456	242	509
Sept. 26-----	218	417	266	344	381	76	165	443	393	454	391	317
Sept. 27-----	77	575	367	310	503	122	134	456	351	458	313	393
Sept. 28-----	170	583	440	410	402	80	56	372	399	438	383	521
Sept. 29-----	74	541	336	422	394	57	42	183	399	333	365	467
Sept. 30-----	109	581	186	421	342	44	254	194	121	449	108	151
Averages-----	116	485	283	395	435	100	176	374	335	433	324	409
Departures---	---	---	---	---	---	---	---	---	-14	---	0	---
Accumulated Departures January 1 to September 30, 1954	---	---	---	---	---	---	---	---	---	---	---	---

1954	Canton Island, Pacific Area	Caribou, Me.	Charleston, S. C.	Columbia, Mo.	Davis, Calif.	Dodge City, Kans.	East Lansing, Mich.	East Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Ely, Nev.	Fairbanks, Alaska
Sept. 3-----	659	314	652	573	562	---	424	---	68	612	---	186
Sept. 4-----	638	439	611	603	575	---	416	---	(220)	620	621	330
Sept. 5-----	662	124	532	577	577	---	417	---	(277)	647	635	362
Sept. 6-----	653	564	617	545	572	---	428	---	(361)	564	535	---
Sept. 7-----	669	164	590	438	539	---	461	---	(376)	620	314	311
Sept. 8-----	646	194	492	593	565	---	277	---	(385)	633	(617)	109
Sept. 9-----	648	381	529	316	535	---	423	246	425	581	556	189
Averages-----	653	312	575	521	561	---	407	---	(302)	611	(546)	248
Departures---	---	---	---	---	20	---	40	---	---	---	---	26
Sept. 10-----	651	223	363	517	553	---	238	227	(413)	617	617	171
Sept. 11-----	646	28	535	604	559	---	278	---	330	620	549	207
Sept. 12-----	642	537	435	575	553	---	261	---	296	---	602	343
Sept. 13-----	672	444	508	573	546	---	81	---	444	---	607	350
Sept. 14-----	---	261	---	247	515	---	75	187	(344)	625	614	148
Sept. 15-----	---	517	---	470	525	---	164	179	138	618	(607)	131
Sept. 16-----	---	473	247	512	512	---	96	161	138	621	606	65
Averages-----	653	355	418	500	538	---	170	189	(300)	620	(600)	202
Departures---	---	---	---	---	40	---	-103	-166	---	---	---	2
Sept. 17-----	---	285	198	537	523	---	190	80	188	621	612	160
Sept. 18-----	---	422	543	490	525	---	114	340	377	616	(587)	322
Sept. 19-----	---	363	630	435	510	---	435	225	163	605	582	344
Sept. 20-----	---	202	453	(295)	520	---	425	186	434	603	600	305
Sept. 21-----	---	413	---	575	506	522	171	171	360	555	565	295
Sept. 22-----	---	114	466	566	492	511	322	473	375	600	412	224
Sept. 23-----	634	217	470	537	490	499	422	498	249	255	536	220
Averages-----	---	268	460	491	509	---	297	282	307	551	(556)	267
Departures---	---	---	---	---	19	---	6	-44	---	---	---	91
Sept. 24-----	686	300	425	481	475	311	292	489	247	265	284	70
Sept. 25-----	642	116	393	126	462	171	403	268	330	434	531	78
Sept. 26-----	683	332	232	510	449	419	315	456	378	445	490	182
Sept. 27-----	669	325	552	459	435	425	379	415	221	577	528	219
Sept. 28-----	689	76	470	268	438	491	234	428	113	588	512	103
Sept. 29-----	693	410	420	371	462	478	66	437	184	562	537	68
Sept. 30-----	719	25	398	162	440	476	103	176	195	571	542	171
Averages-----	683	226	413	340	451	396	256	381	238	492	489	127
Departures---	---	---	---	---	-13	---	-25	23	---	---	---	-7
Accumulated Departures January 1 to September 30, 1954	---	---	---	---	---	---	-994	---	---	---	---	---

1954	Fort Worth, Tex.	Fresno, Calif.	Grand Junction, Colo	Great Falls, Mont.	Greensboro, N. C.	Griffin, Ga.	Hatteras, N. C.	Indianapolis, Ind.	Ithaca, N. Y.	Lake Charles, La.	Las. Vegas, Nev.	Lincoln, Neb.
Sept. 3-----	699	610	263	(372)	596	552	679	480	404	591	572	519
Sept. 4-----	695	613	481	505	569	522	626	545	501	605	---	510
Sept. 5-----	687	609	431	264	570	505	634	549	232	427	636	531
Sept. 6-----	600	595	591	596	511	485	653	445	383	233	622	326
Sept. 7-----	575	484	537	(476)	555	532	627	94	232	378	---	533
Sept. 8-----	608	598	460	417	533	442	613	573	330	480	620	387
Sept. 9-----	633	583	633	563	524	352	565	492	547	543	624	342
Averages-----	642	585	485	(456)	551	484	628	454	376	465	513	450
Departures---	---	18	---	---	---	---	---	---	-15	---	---	10
Sept. 10-----	697	584	498	518	405	465	83	304	165	530	593	534
Sept. 11-----	693	588	298	537	578	543	580	561	55	574	464	534
Sept. 12-----	697	581	195	538	560	524	326	515	564	629	604	492
Sept. 13-----	698	583	594	542	585	436	533	480	250	601	620	445
Sept. 14-----	604	(576)	552	528	515	511	540	235	258	582	635	434
Sept. 15-----	648	580	604	50	426	207	154	460	18	549	630	465
Sept. 16-----	628	572	611	218	508	145	232	479	64	220	618	213
Averages-----	666	(580)	479	419	511	404	350	433	196	526	595	445
Departures---	---	41	---	---	---	---	---	---	-150	---	---	23
Sept. 17-----	549	569	601	109	537	233	560	455	221	409	614	447
Sept. 18-----	515	559	604	492	498	475	419	428	129	537	603	511
Sept. 19-----	628	556	602	510	387	503	470	302	259	545	606	530
Sept. 20-----	596	549	607	492	150	507	297	462	443	570	599	442
Sept. 21-----	672	521	595	522	369	453	478	529	83	446	591	537
Sept. 22-----	660	562	568	368	570	542	504	535	251	600	519	525
Sept. 23-----	658	532	179	457	531	516	463	507	265	591	573	483
Averages-----	611	550	536	421	434	461	456	460	236	528	586	497
Departures---	---	48	---	---	---	---	---	---	-108	---	---	91
Sept. 24-----	643	514	431	484	515	525	605	465	491	556	540	141
Sept. 25-----	594	501	267	476	439	351	571	435	294	507	542	459
Sept. 26-----	606	485	417	479	278	329	427	403	212	475	526	482
Sept. 27-----	531	448	531	469	509	477	576	404	410	466	536	362
Sept. 28-----	495	500	515	118	---	483	542	223	426	220	514	354
Sept. 29-----	451	496	330	141	---	486	536	194	386	486	523	158
Sept. 30-----	173	(499)	524	206	363	293	555	116	254	447	553	310
Averages-----	499	(492)	431	339	421	420	545	320	353	451	533	324
Departures---	---	19	---	---	---	---	---	---	19	---	---	-37
Accumulated Departures January 1 to September 30, 1954	---	7105	---	---	---	---	---	---	-3269	---	---	---

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.-Continued SEPTEMBER 1954

	Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBCO)	Madison, Wisc.	Medford, Oreg.	Miami, Fla.	Midland, Texas	Nashville, Tenn.	Newport, R. I.	New York, N. Y.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Ottawa, Ontario	Phoenix, Ariz.	Prosser 4 NE, Wash.	Rapid City, S. Dak.	Riverside, Calif.
1954																	
Sept. 3-----	586	538	(495)	379	566	586	674	588	430	435	557	634	515	624	599	311	621
Sept. 4-----	570	481	504	416	606	533	670	590	571	567	---	649	594	567	605	469	604
Sept. 5-----	536	491	445	477	640	576	646	514	413	423	---	618	399	629	586	392	639
Sept. 6-----	422	562	575	511	602	442	657	473	557	503	---	634	640	636	532	599	606
Sept. 7-----	432	578	587	553	590	573	660	385	316	446	527	543	253	608	333	465	615
Sept. 8-----	555	567	559	398	594	539	627	395	115	110	279	603	282	637	575	240	---
Sept. 9-----	512	545	543	130	586	585	641	574	286	535	528	498	643	625	551	587	613
Averages-----	516	537	(530)	409	598	548	654	503	384	431	473	597	475	618	540	438	617
Departures---	---	---	---	20	---	---	---	---	-56	57	---	---	---	---	---	---	110
Sept. 10-----	575	483	475	125	185	614	600	535	---	194	362	645	170	608	525	561	584
Sept. 11-----	589	470	(525)	513	383	535	718	530	---	109	479	626	214	(401)	568	543	563
Sept. 12-----	583	508	(496)	132	574	369	572	607	---	588	564	637	614	(602)	487	415	609
Sept. 13-----	562	566	540	23	571	232	644	549	---	482	498	636	42	(632)	533	485	613
Sept. 14-----	559	562	565	49	223	415	633	500	236	318	480	526	592	---	404	489	600
Sept. 15-----	514	570	553	84	319	(541)	563	558	174	27	489	568	571	(617)	350	364	596
Sept. 16-----	516	---	521	181	414	610	588	520	78	66	443	568	55	(635)	245	529	597
Averages-----	557	526	(525)	158	381	(474)	617	543	163	255	473	601	323	(583)	445	484	595
Departures---	---	---	---	-188	---	---	---	---	-214	-95	---	---	---	---	---	---	107
Sept. 17-----	375	674	546	(373)	510	577	581	322	94	244	448	576	(200)	---	335	329	600
Sept. 18-----	267	---	575	364	554	264	554	458	149	104	447	614	(195)	596	400	523	600
Sept. 19-----	484	---	598	485	550	498	621	435	101	36	408	553	126	601	515	553	603
Sept. 20-----	507	---	591	430	541	600	469	134	118	98	87	557	294	616	513	544	607
Sept. 21-----	564	531	544	269	486	412	567	395	226	122	182	606	(349)	594	---	553	563
Sept. 22-----	548	565	513	471	380	369	---	585	490	512	550	584	(224)	478	(387)	490	539
Sept. 23-----	543	507	515	434	509	351	578	575	521	536	538	585	306	550	462	393	560
Averages-----	470	569	555	(404)	504	439	562	415	243	236	380	582	(242)	571	(435)	483	582
Departures---	---	---	---	47	---	---	---	---	-107	-91	---	---	---	---	---	---	115
Sept. 24-----	528	453	504	236	492	427	578	532	522	498	517	576	(545)	539	479	496	557
Sept. 25-----	473	515	514	448	498	205	510	445	255	290	458	480	(100)	576	486	488	535
Sept. 26-----	477	510	513	472	479	---	---	343	468	440	239	295	(115)	591	484	483	468
Sept. 27-----	319	450	473	435	453	421	531	472	444	502	466	447	(383)	580	344	486	515
Sept. 28-----	316	316	343	49	494	308	535	421	452	449	382	503	344	565	200	479	433
Sept. 29-----	278	348	222	205	503	475	266	268	458	419	326	383	284	570	476	183	327
Sept. 30-----	71	311	324	230	461	391	496	257	176	161	179	366	110	575	467	152	404
Averages-----	352	415	413	297	483	371	486	391	397	394	367	436	(269)	571	419	395	463
Departures---	---	---	---	-11	---	---	---	---	42	79	---	---	---	---	---	---	18

	St. Cloud, Minn.	San Antonio, Tex.	Santa Maria, Calif.	S. Ste. Marie, Mich.	Sayville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle, Wash. (WBAS)	Spokane, Wash.	State College, Pa.	Stillwater, Okla.	Swan Island, W. I.	Tampa, Fla.	Toronto, Ontario	Upton, N. Y.	Wake Island, Pacific Area	Washington, D. C. (Silver Hill Obs.)	Winnipeg, Manitoba
1954																		
Sept. 3-----	136	---	562	414	456	232	509	384	---	484	558	674	617	407	---	537	523	531
Sept. 4-----	350	601	612	69	611	403	563	299	---	443	565	---	523	351	607	635	---	307
Sept. 5-----	162	659	643	345	459	362	527	364	---	497	547	434	484	317	---	609	---	457
Sept. 6-----	429	647	571	147	542	442	499	488	---	467	555	---	612	468	---	516	---	129
Sept. 7-----	247	669	645	(347)	452	173	493	396	---	304	258	637	502	370	---	462	---	457
Sept. 8-----	347	641	629	459	162	190	330	499	---	212	524	619	598	306	174	394	---	417
Sept. 9-----	76	656	---	262	527	339	345	454	604	411	410	627	615	525	---	115	---	299
Averages-----	250	645	610	(292)	458	306	467	412	---	403	488	594	564	392	---	467	---	371
Departures---	---	---	---	---	---	---	---	---	---	14	---	---	---	---	---	---	---	---
Sept. 10-----	480	553	591	71	254	240	70	146	551	7	579	635	595	314	275	544	178	351
Sept. 11-----	468	705	617	471	---	498	224	308	581	111	543	562	581	381	---	481	377	294
Sept. 12-----	264	696	640	272	---	493	566	263	352	534	551	329	427	421	---	600	566	434
Sept. 13-----	54	666	611	449	580	219	536	313	550	440	522	524	438	58	---	271	561	469
Sept. 14-----	64	---	589	480	283	307	483	164	491	194	213	293	312	414	---	348	490	331
Sept. 15-----	105	---	634	225	94	278	90	213	119	12	475	---	400	137	---	574	247	423
Sept. 16-----	46	582	616	(474)	86	30	251	164	353	207	497	223	504	89	(63)	636	425	32
Averages-----	212	641	614	(349)	259	295	317	225	428	215	483	438	465	260	---	493	406	333
Departures---	---	---	---	---	---	---	---	---	---	-160	---	---	---	---	---	---	---	---
Sept. 17-----	131	426	619	83	158	182	---	114	216	333	499	649	310	92	(103)	515	489	349
Sept. 18-----	177	423	609	78	380	216	---	173	399	138	506	572	488	107	(463)	611	354	71
Sept. 19-----	485	441	614	253	42	96	---	249	494	290	460	---	388	376	---	319	217	207
Sept. 20-----	388	511	(601)	233	115	369	---	382	519	304	456	613	494	495	---	---	183	79
Sept. 21-----	275	439	471	44	132	132	---	294	463	8	544	532	465	108	---	549	119	425
Sept. 22-----	480	615	(489)	290	506	161	---	380	492	264	526	241	221	348	---	585	526	450
Sept. 23-----	338	602	484	417	546	277	---	284	528	427	514	297	268	470	---	---	526	323
Averages-----	325	494	(555)	200	268	205	---	268	444	252	501	498	376	285	---	516	345	272
Departures---	---	---	---	---	---	---	---	---	---	-72	---	---	---	---	---	---	---	---
Sept. 24-----	389	533	479	109	(519)	427	---	319	529	445	493	---	336	373	540	568	505	394
Sept. 25-----	400	532	468	366	232	195	---	364	523	341	301	342	356	406	230	598	447	400
Sept. 26-----	471	552	461	184	474	242	---	390	507	364	342	347	317	263	---	533	342	---
Sept. 27-----	468	522	(420)	235	484	380	---	131	318	428	213	356	392	419	---	607	485	---
Sept. 28-----	152	524	330	398	479	366	---	320	203	401	448	532	430	405	482	251	433	---
Sept. 29-----	153	408	368	41	420	320	---	362	477	358	372	---	400	238	438	607	432	196
Sept. 30-----	198	201	443	36	180	358	---	413	491	222	154	---	444	365	---	---	390	431
Averages-----	319	467	(424)	196	(398)	327	---	328	435	365	332	417	382	353	423	527	434	320
Departures---	---	---	---	---	---	---	---	---	---	26	---	---	---	---	---	---	---	---

Accumulated Departures January 1 to September 30, 1954

Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBCO)	Madison, Wisc.	Medford, Oreg.	Miami, Fla.	Midland, Texas	Nashville, Tenn.	Newport, R. I.	New York, N. Y.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Ottawa, Ontario	Phoenix, Ariz.	Prosser 4 NE, Wash.	Rapid City, S. Dak.	Riverside, Calif.
---	---	---	-120	---	---	---	---	---	---	---	---	---	---	---	---	15463

St. Cloud, Minn.	San Antonio, Tex.	Santa Maria, Calif.	S. Ste. Marie, Mich.	Sayville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle, Wash. (WBAS)	Spokane, Wash.	State College, Pa.	Stillwater, Okla.	Swan Island, W. I.	Tampa, Fla.	Toronto, Ontario	Upton, N. Y.	Wake Island, Pacific Area	Washington, D. C. (Silver Hill Obs.)	Winnipeg, Manitoba
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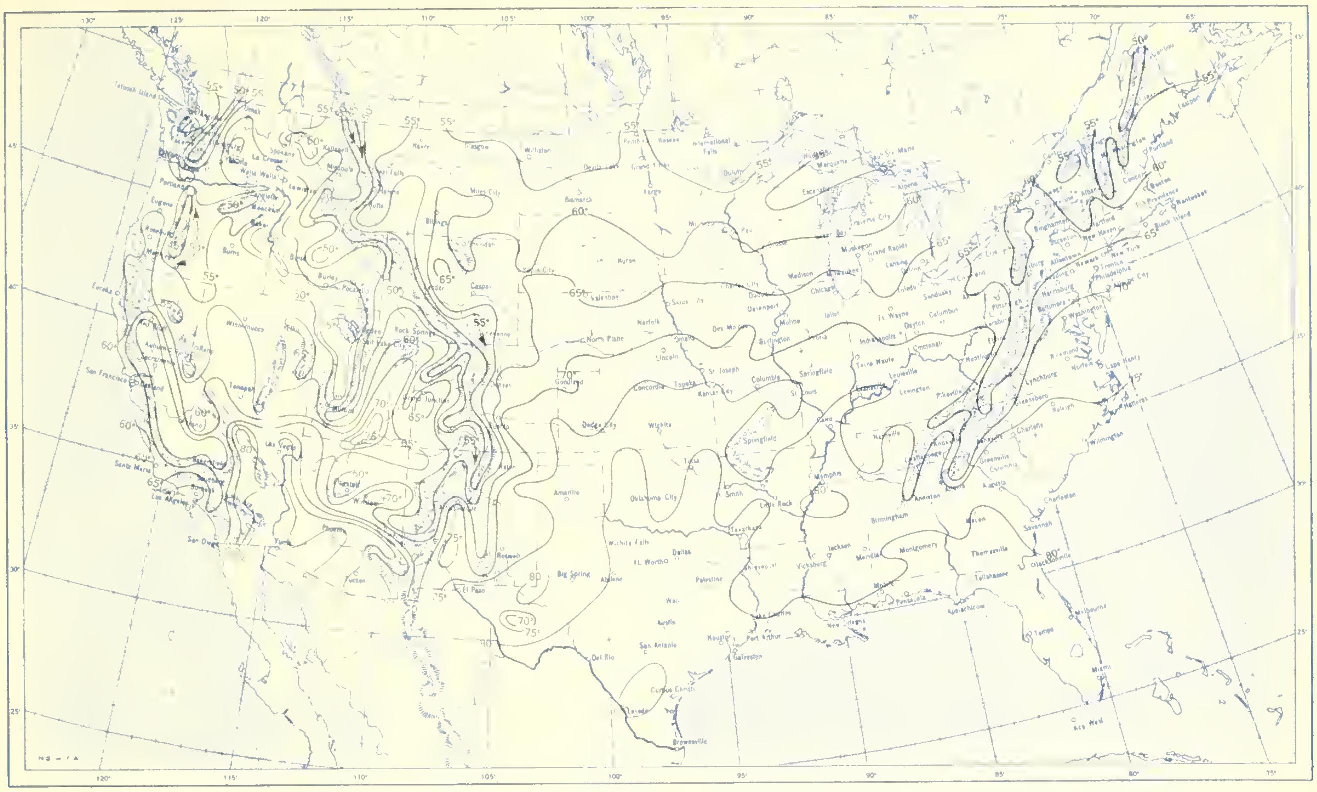
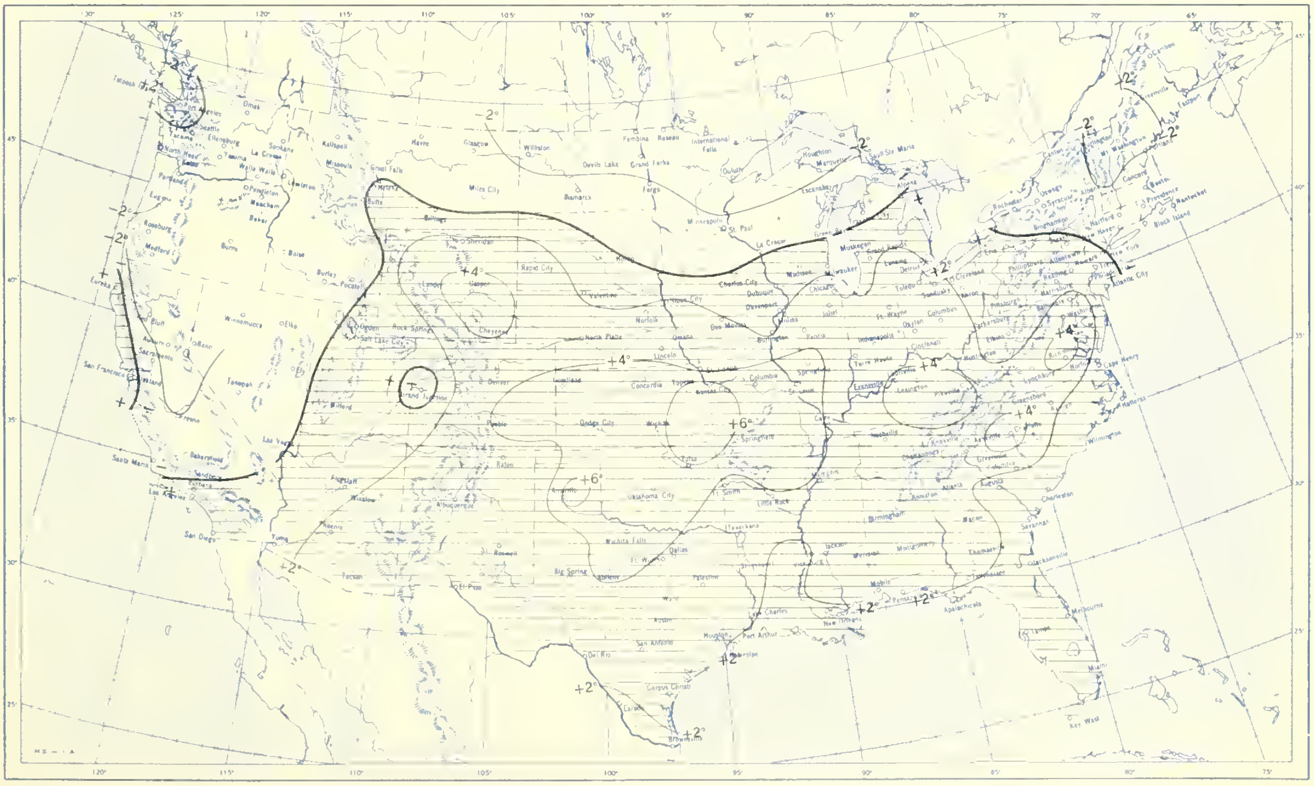
Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

NWRC, Asheville, N. C.,---11/10/54---1800

Chart I. A. Average Temperature (°F.) at Surface, September 1954.

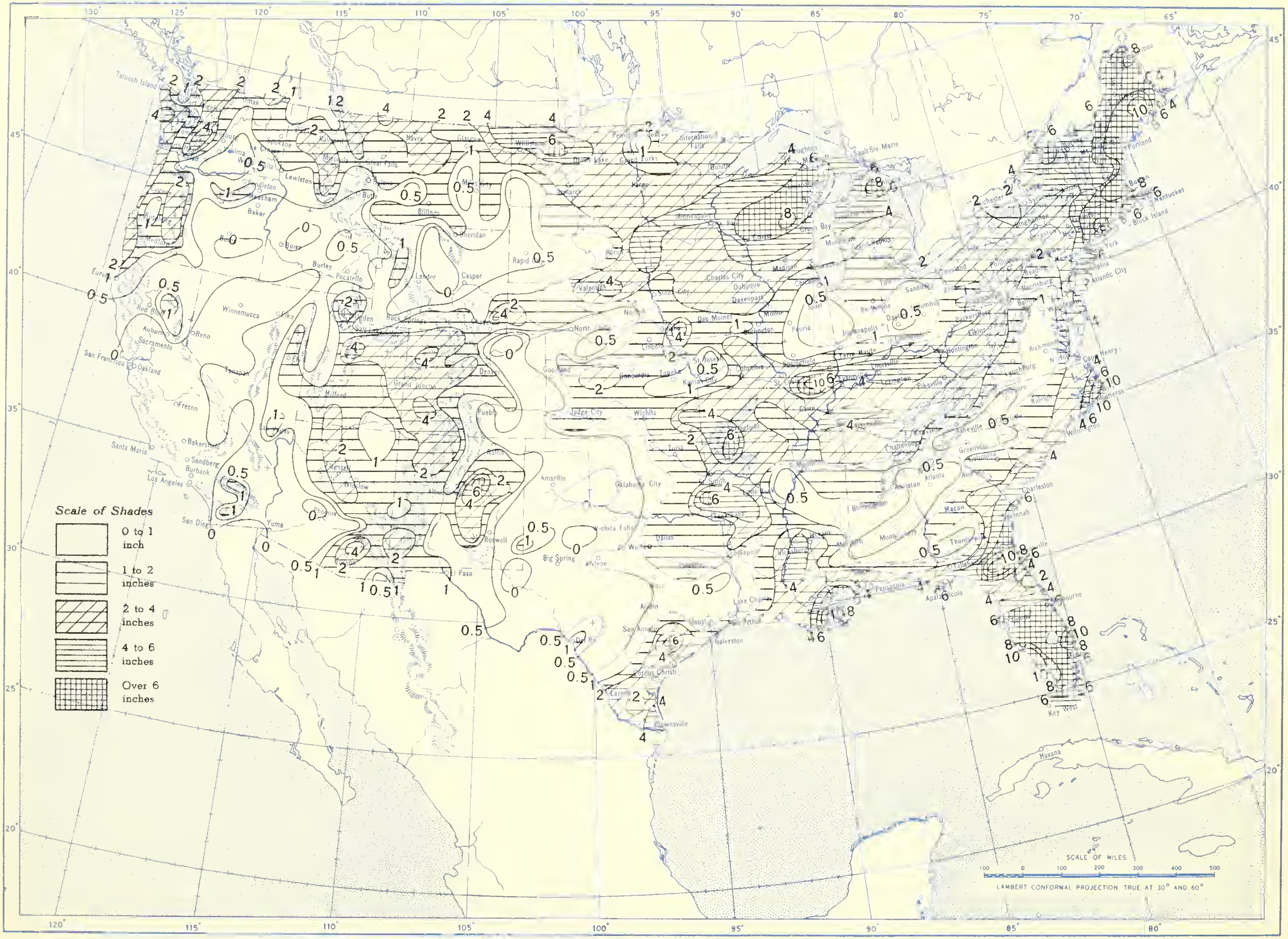


B. Departure of Average Temperature from Normal (°F.), September 1954.



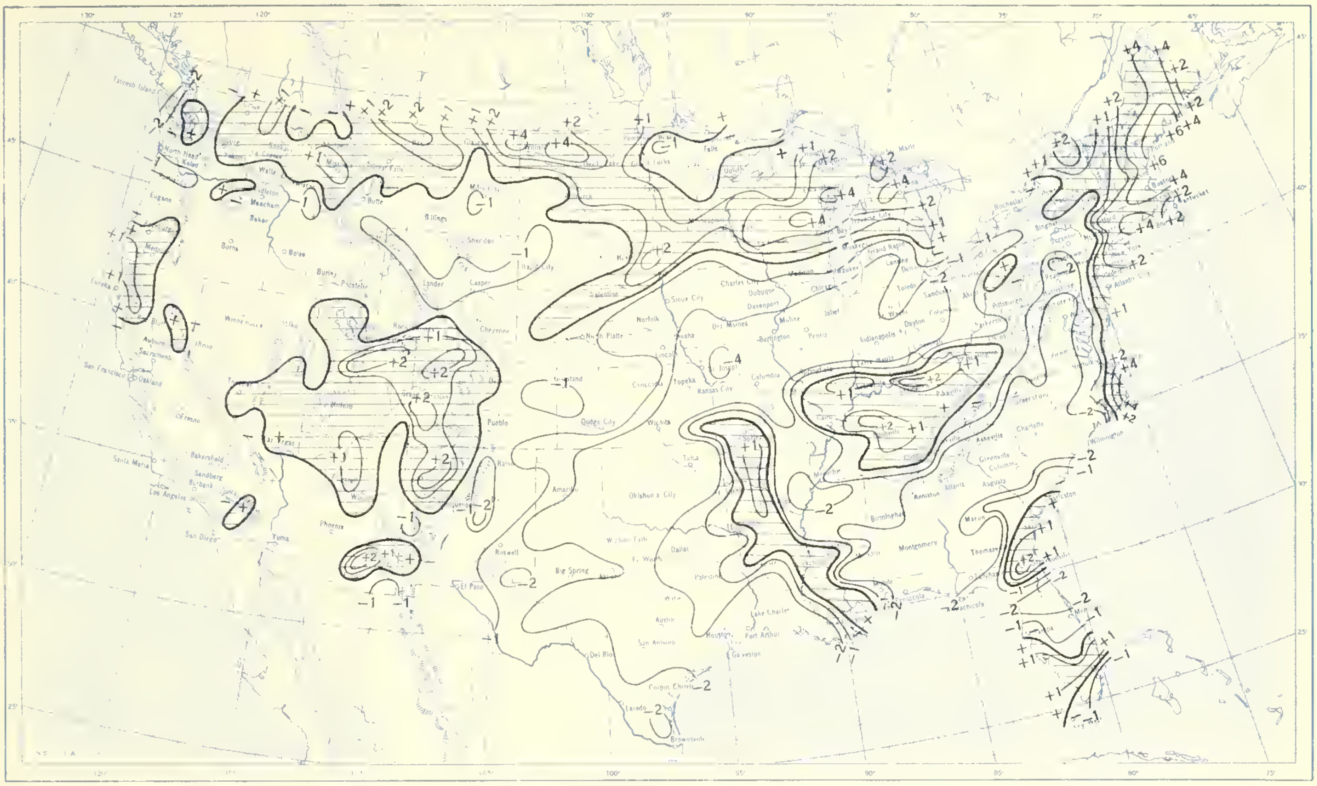
A. Based on reports from 800 Weather Bureau and coöperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.
B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), September 1954.

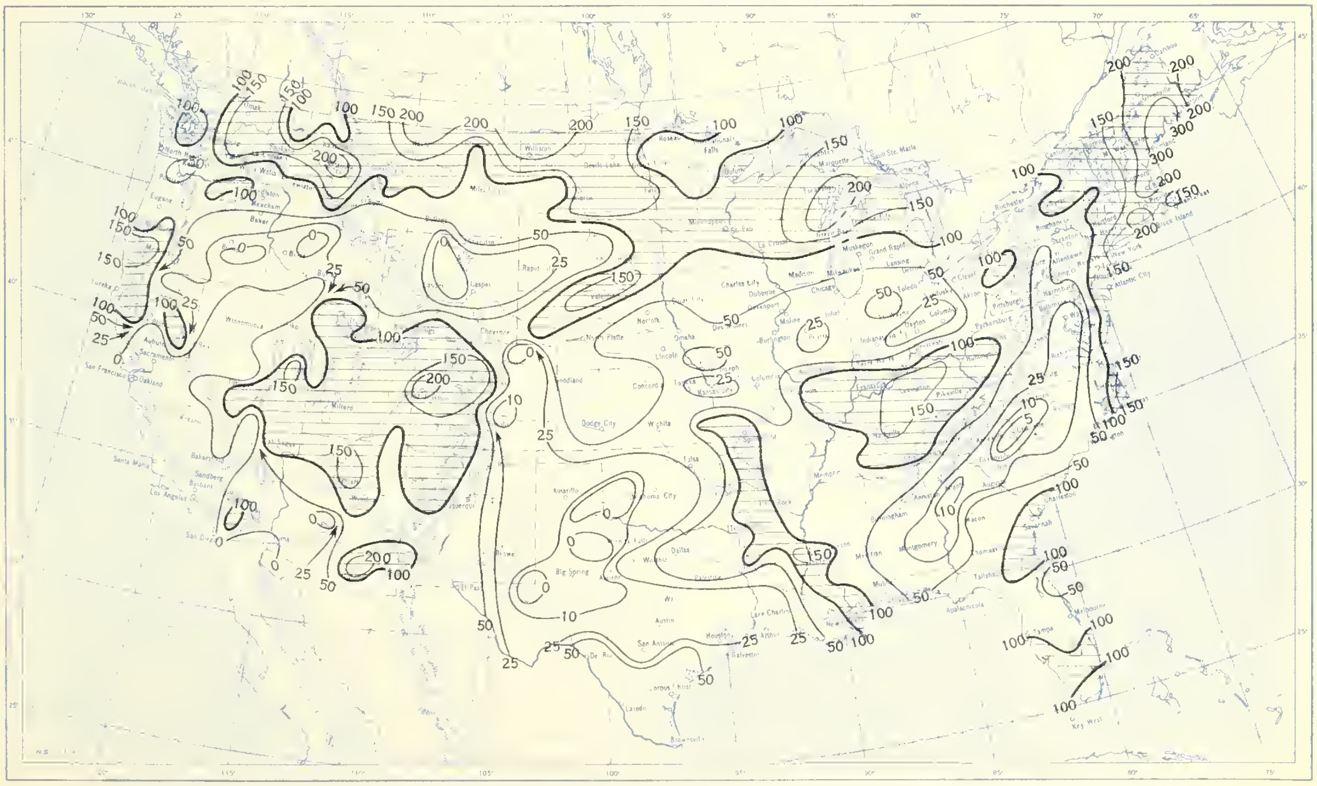


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), September 1954.

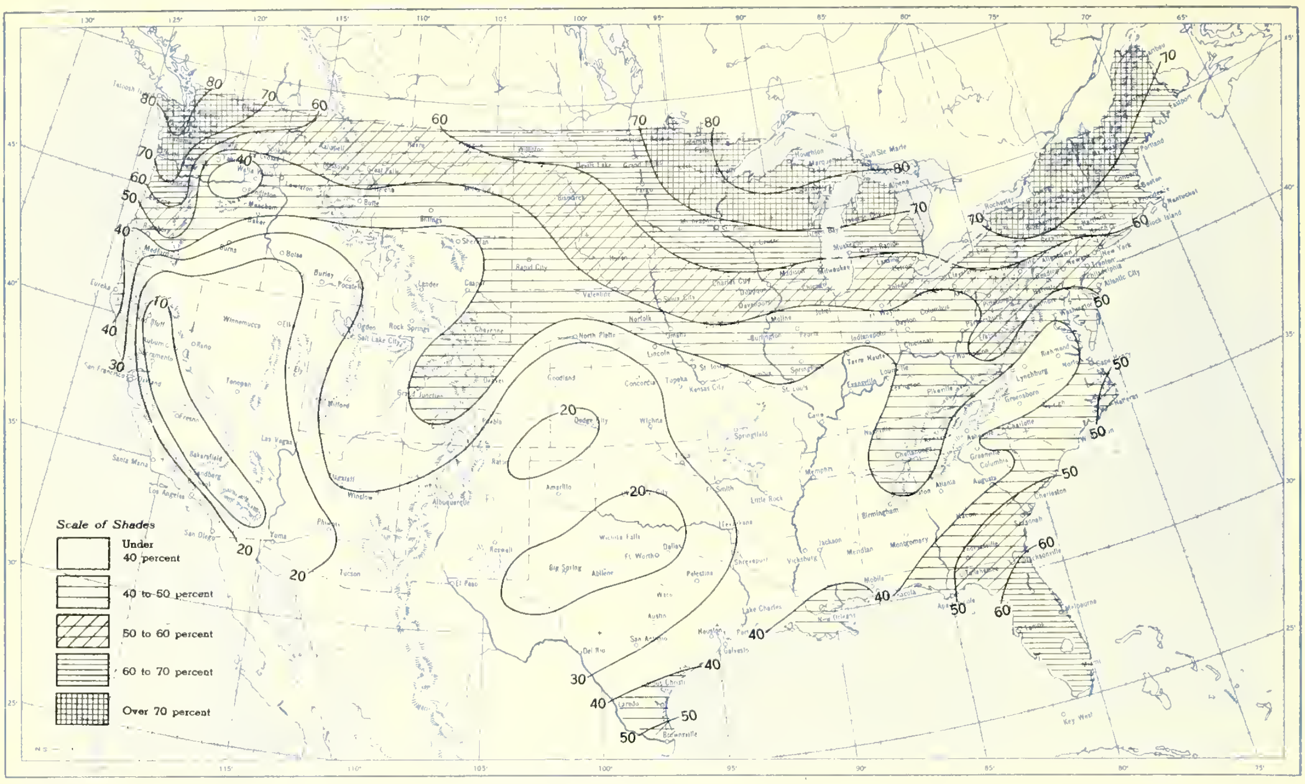


B. Percentage of Normal Precipitation, September 1954.

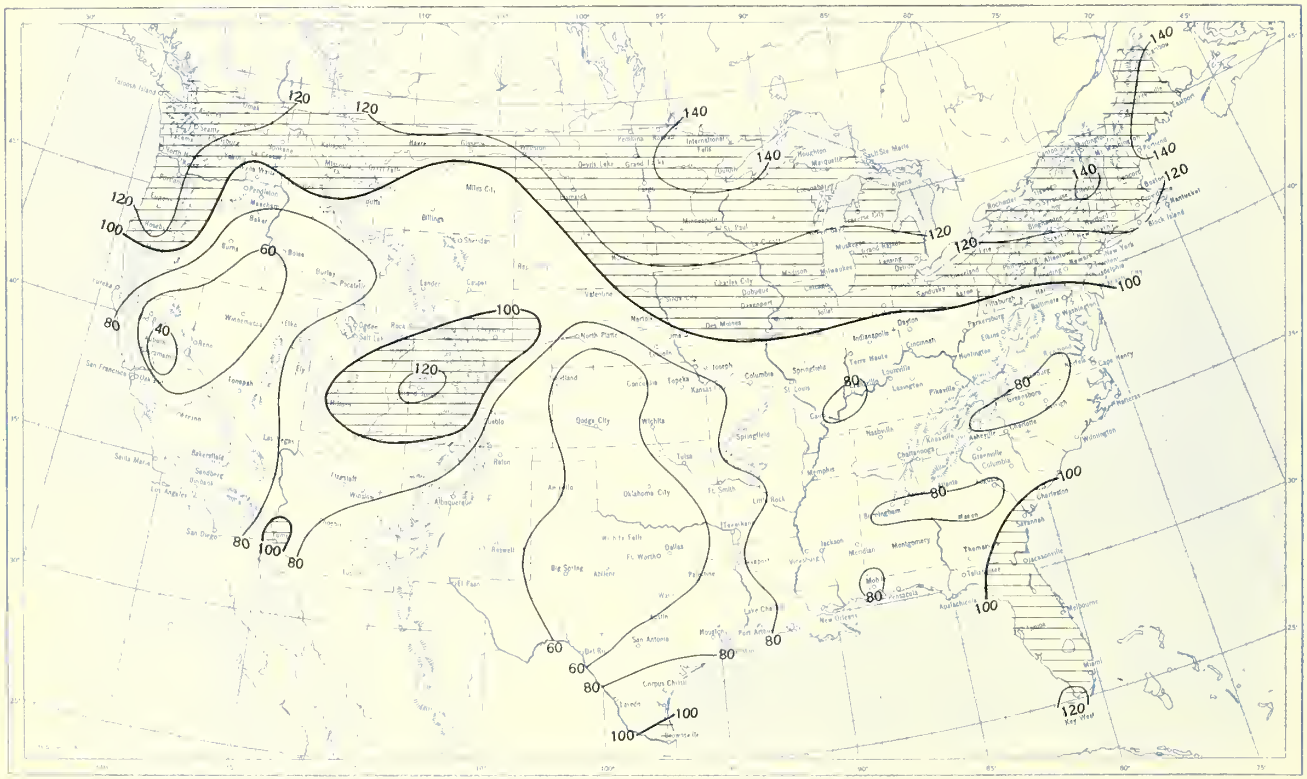


Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, September 1954.

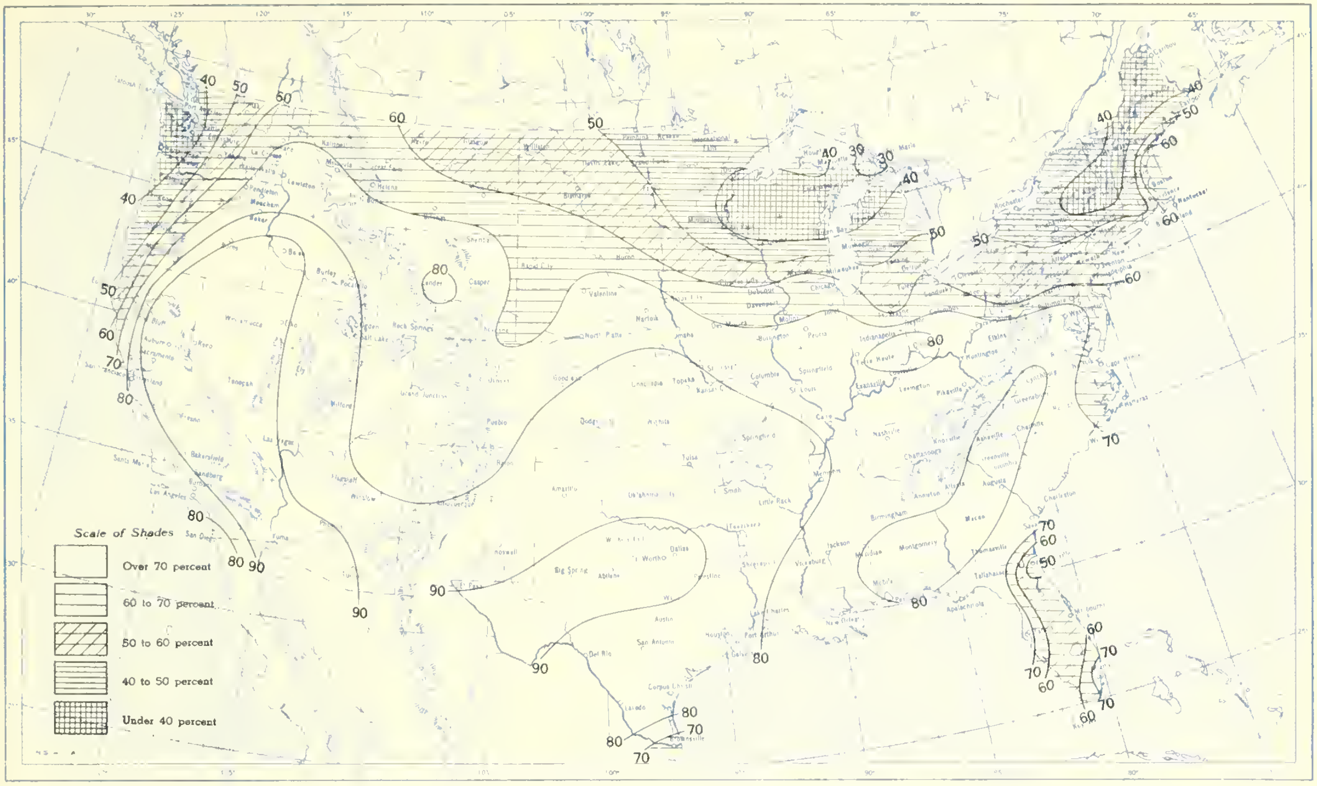


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, September 1954.

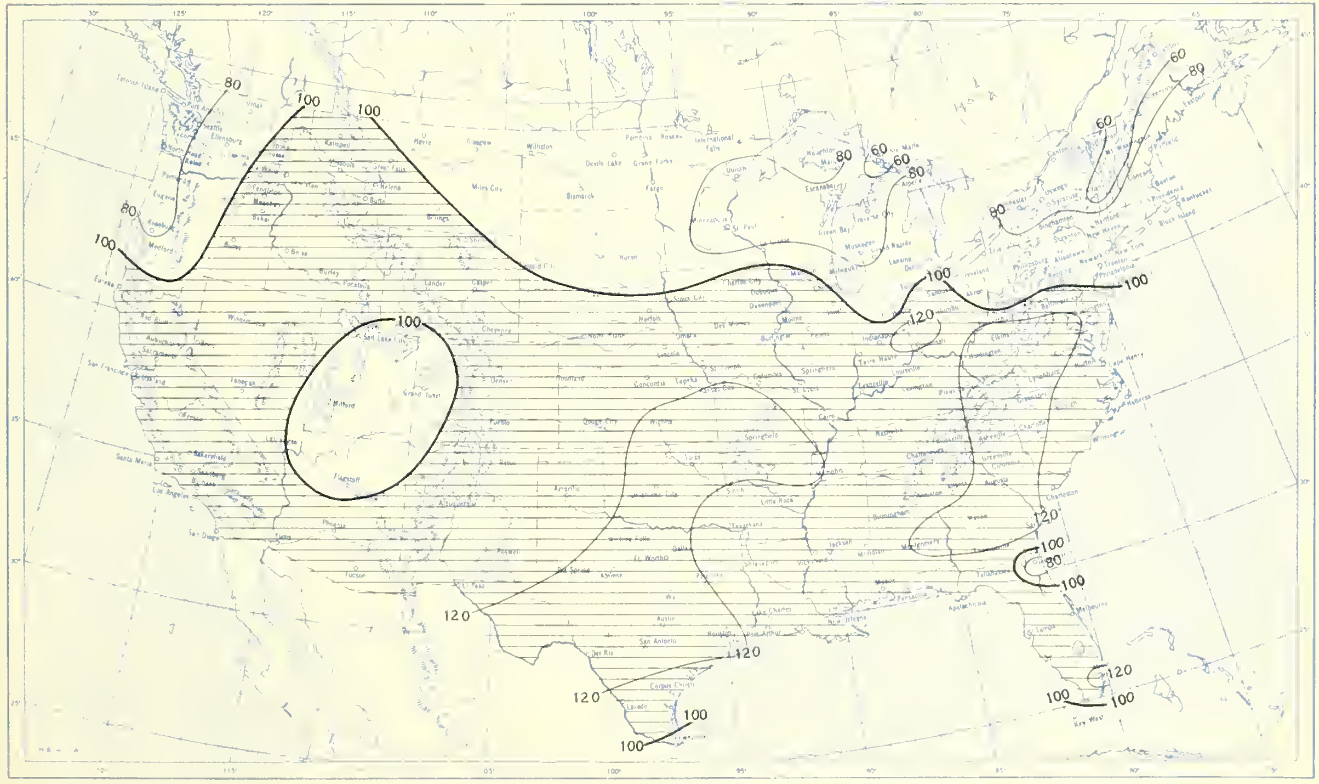


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, September 1954.



B. Percentage of Normal Sunshine, September 1954.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, September 1954. Inset: Percentage of Normal Average Daily Solar Radiation, September 1954.

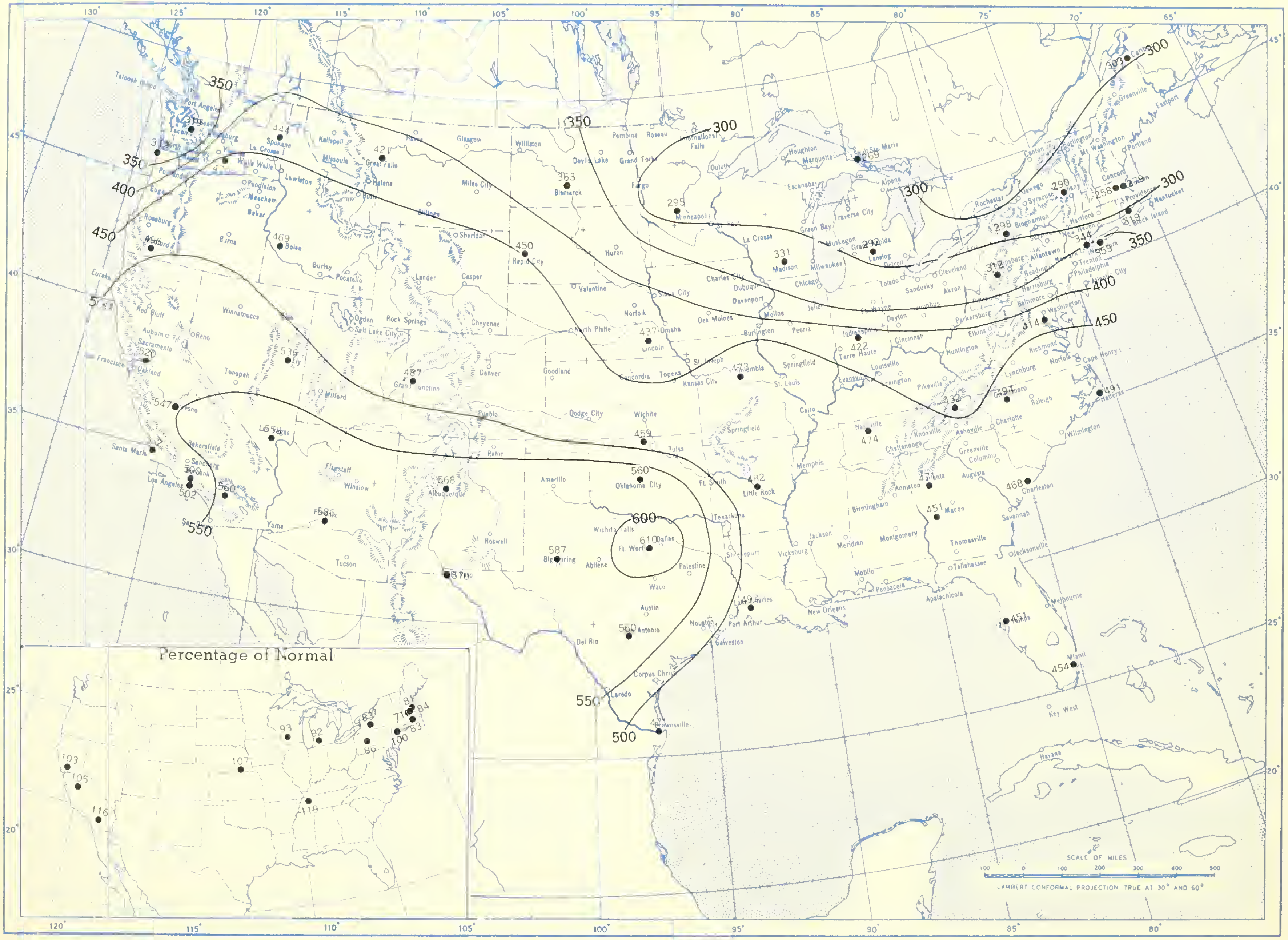
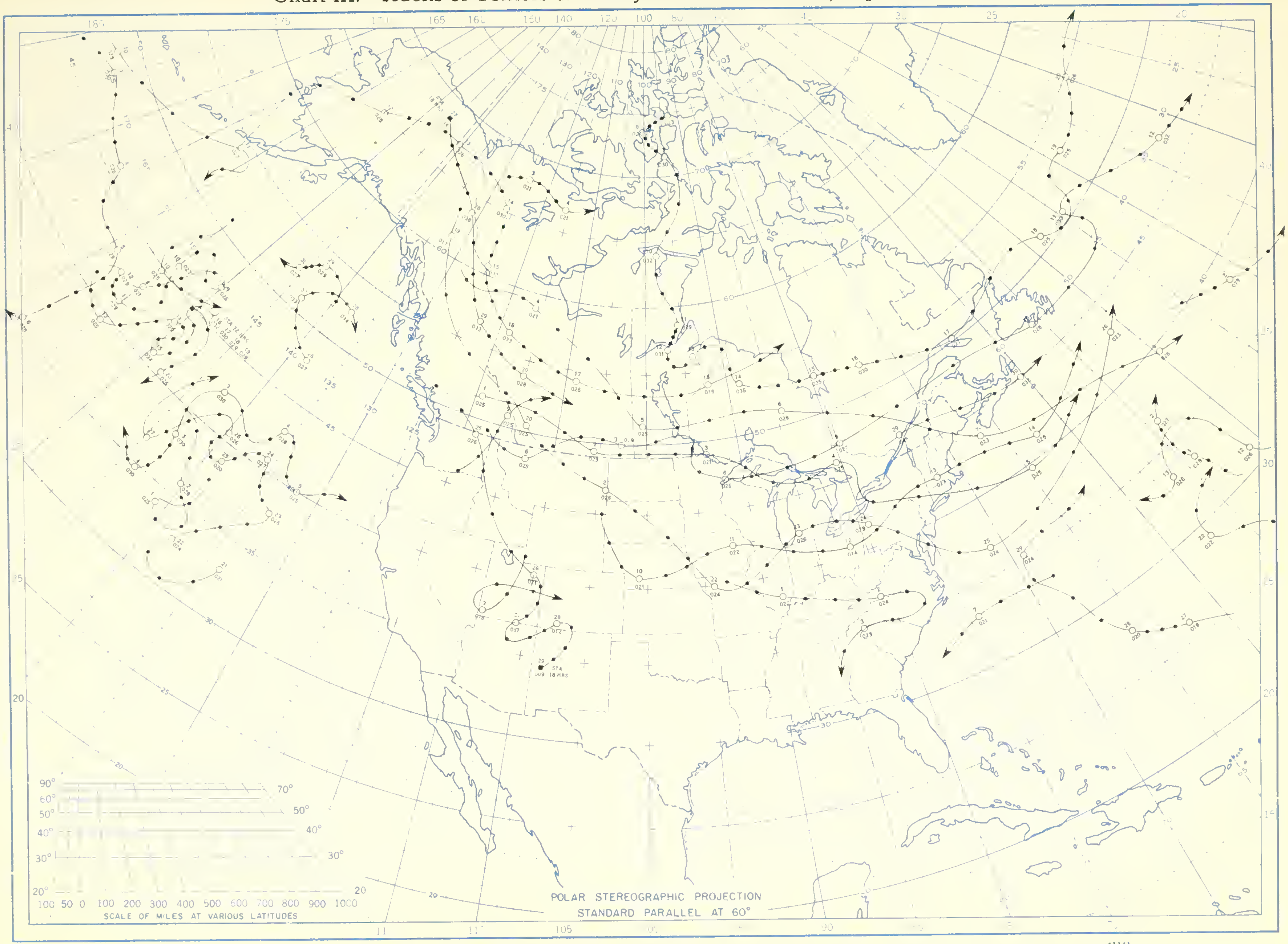


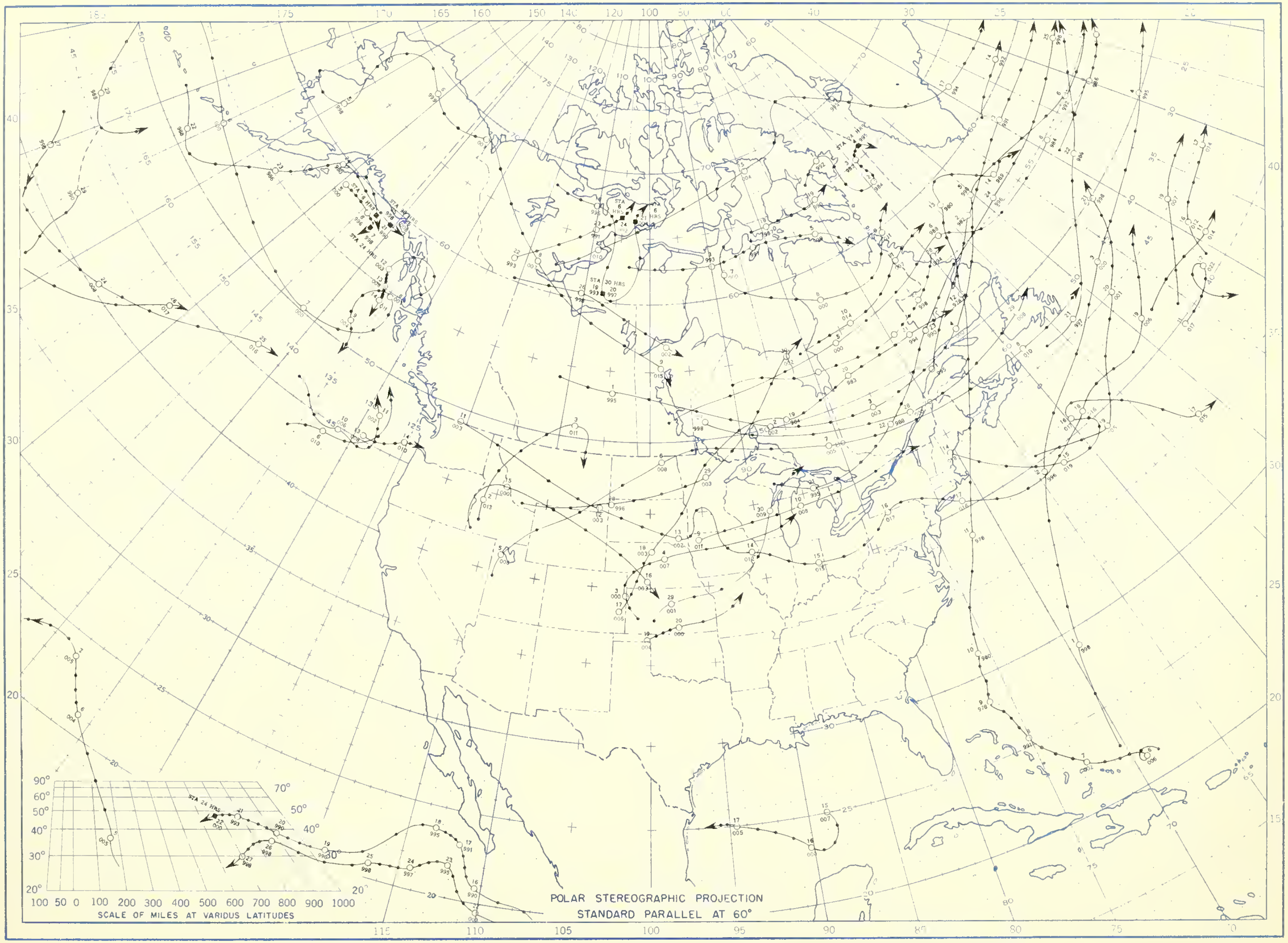
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm.^{-2}). Basic data for isolines are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are computed for stations having at least 9 years of record.

Chart IX. Tracks of Centers of Anticyclones at Sea Level, September 1954.



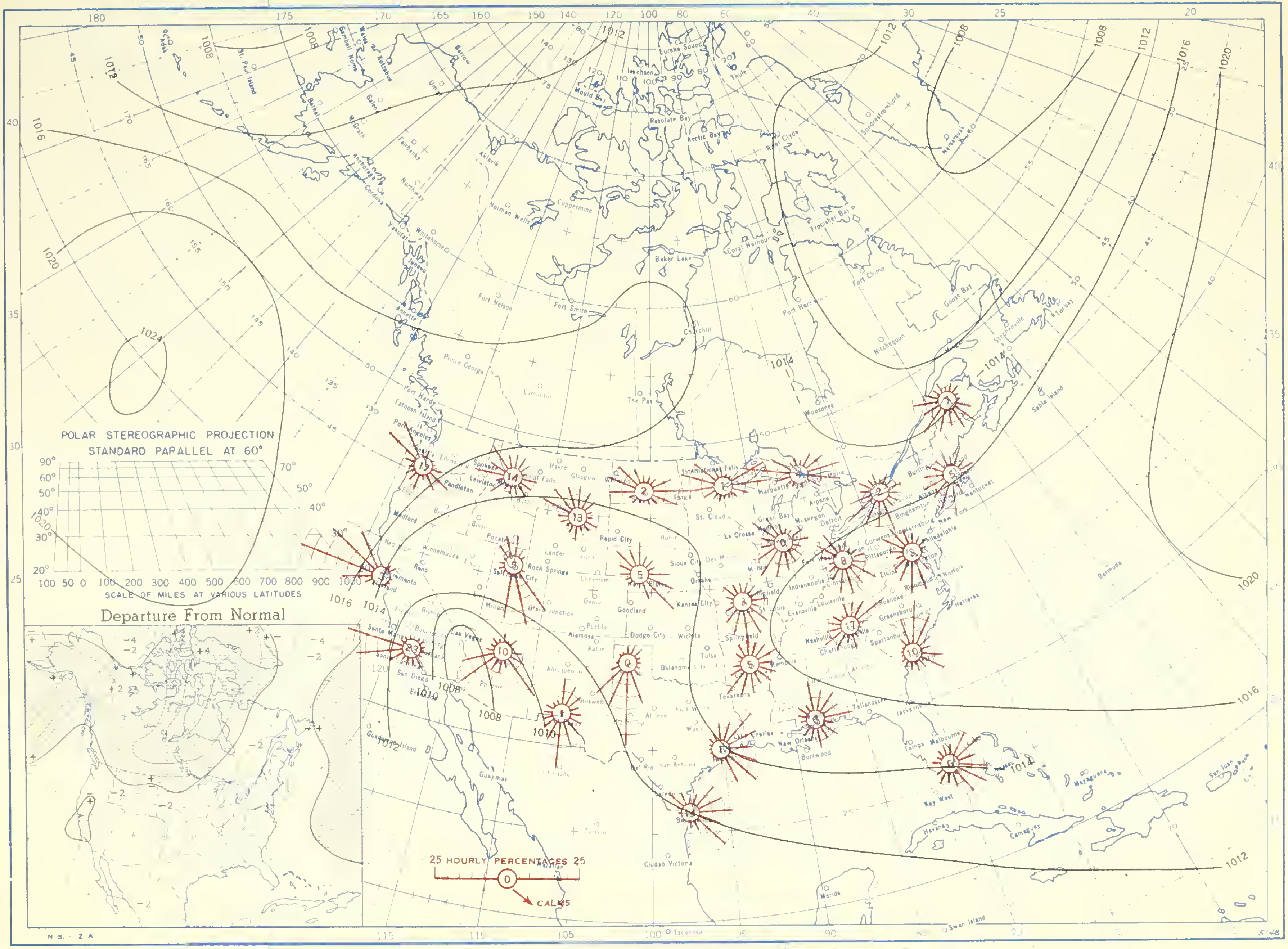
Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

Chart X. Tracks of Centers of Cyclones at Sea Level, September 1954.



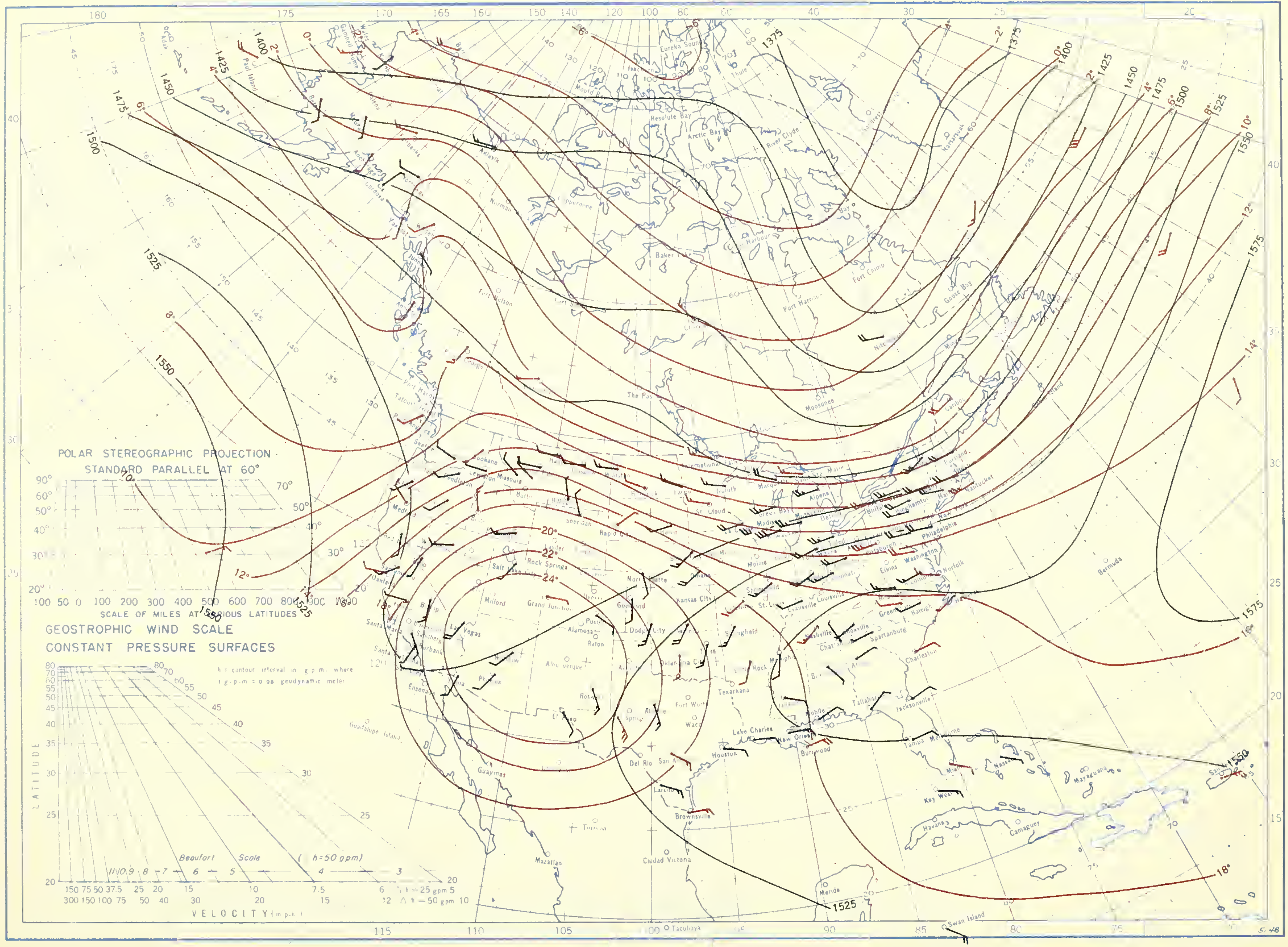
Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, September 1954. Inset: Departure of Average Pressure (mb.) from Normal, September 1954.



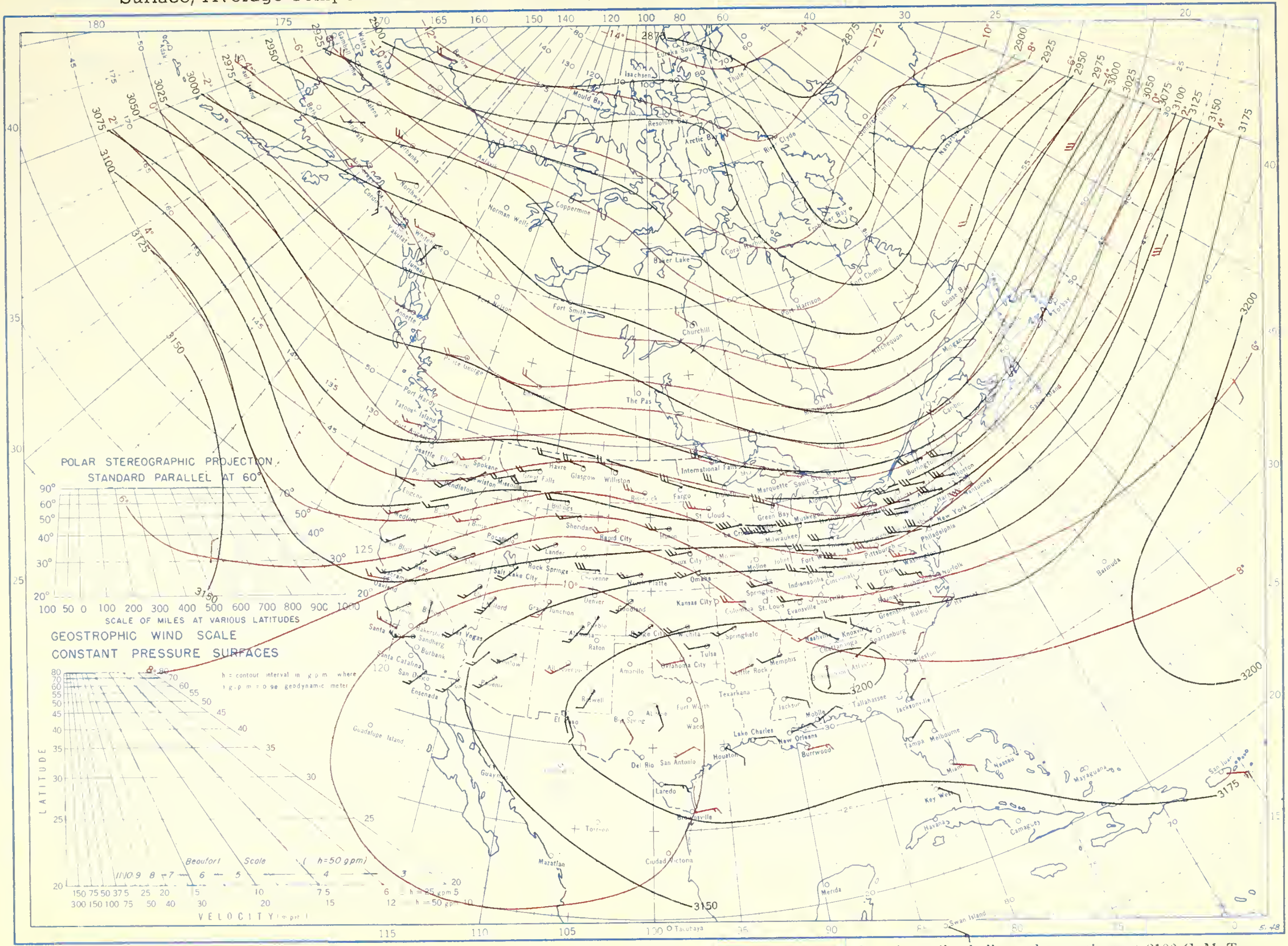
Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), September 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

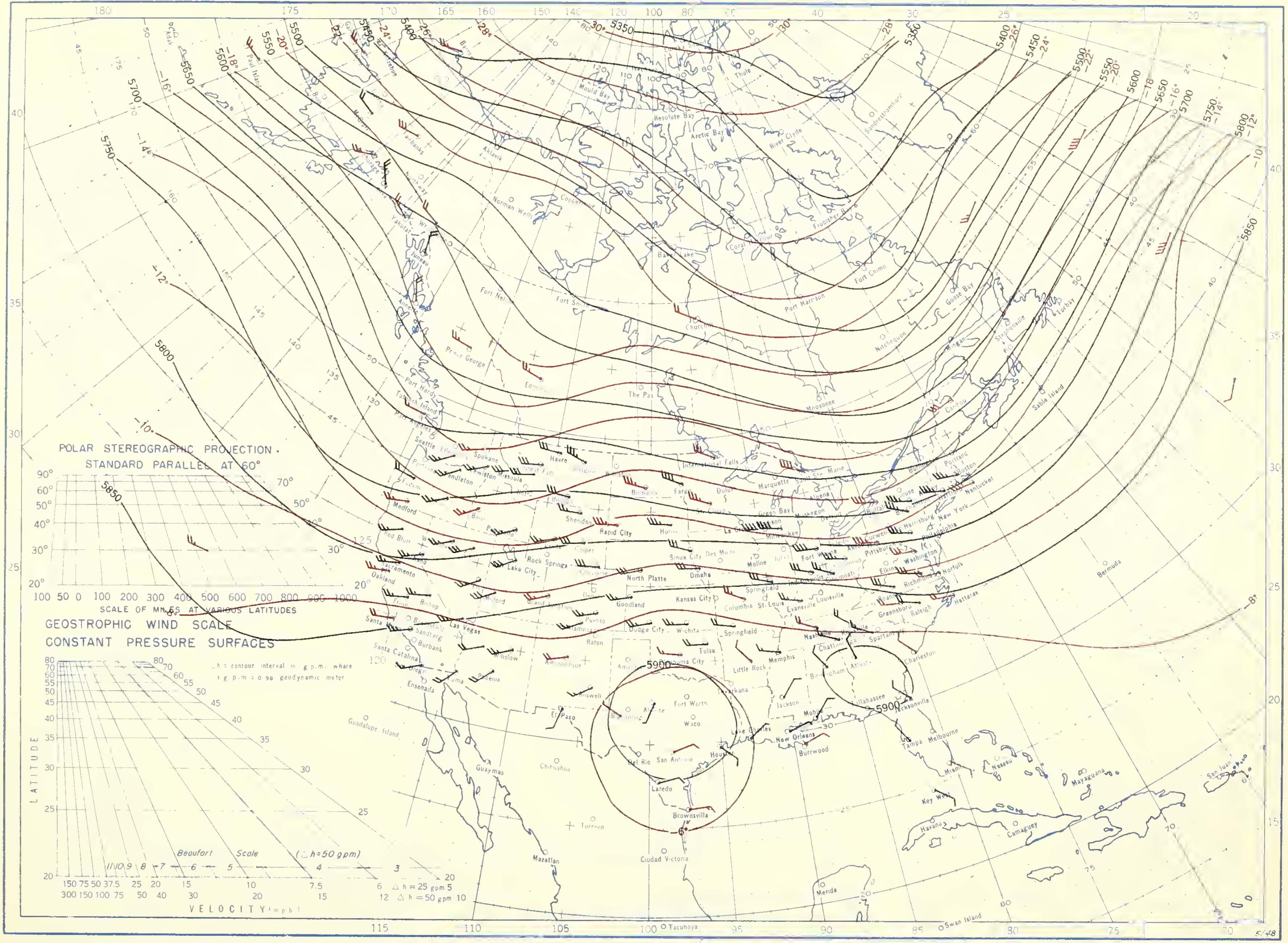
Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m.. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), September 1954.



POLAR STEREOGRAPHIC PROJECTION
STANDARD PARALLEL AT 60°
SCALE OF MILES AT VARIOUS LATITUDES
GEOSTROPHIC WIND SCALE
CONSTANT PRESSURE SURFACES
h = contour interval in g.p.m. where 1 g.p.m. = 0.98 geodynamic meter
Beaufort Scale
(h=50 gpm)
VELOCITY (m.p.h.)
LATITUDE
3200
3175
3150
3125
3100
3075
3050
3025
3000
2975
2950
2925
2900
2875

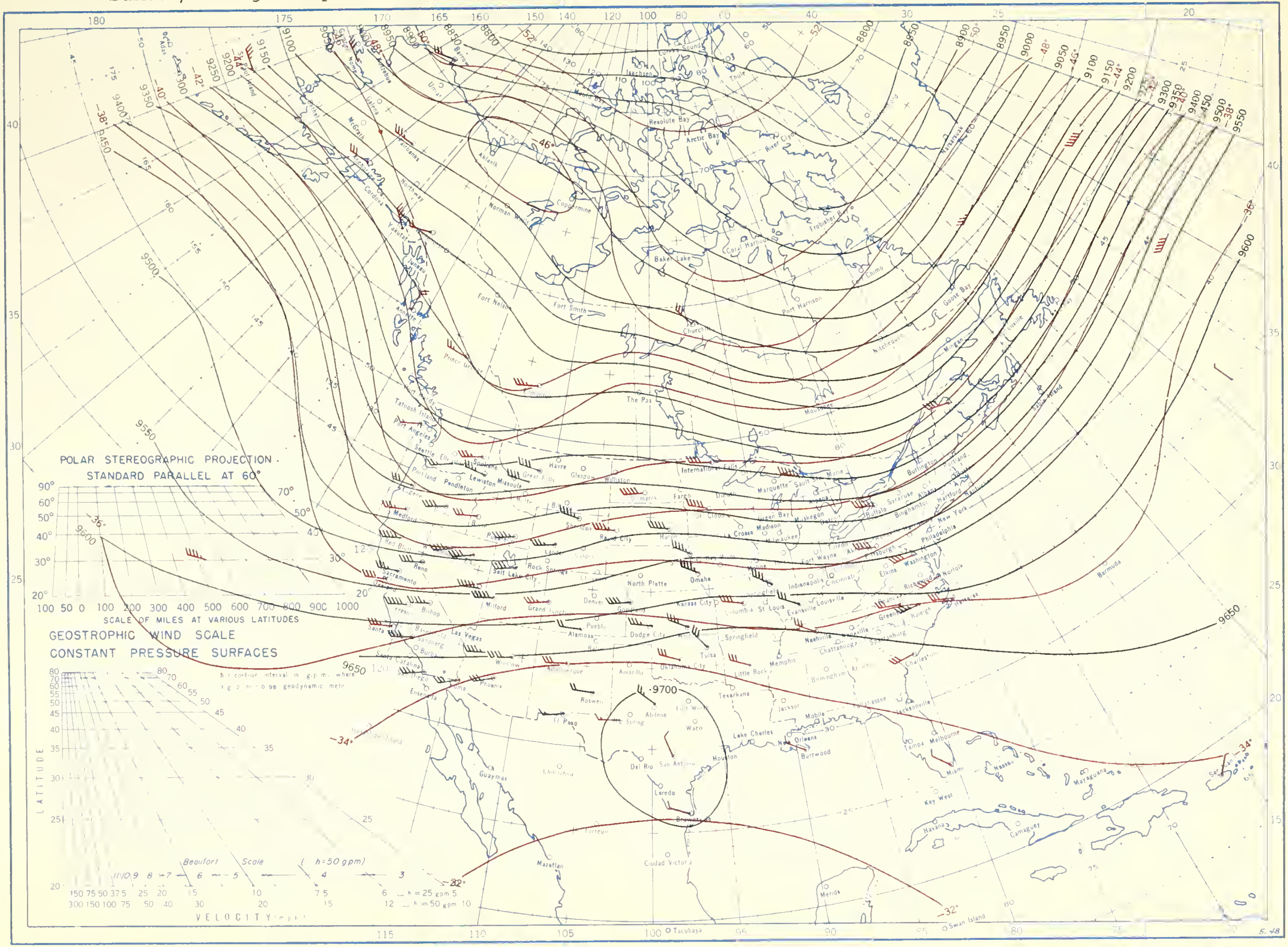
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), September 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 300-mb. Pressure Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), September 1954.



5.48

Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

OCTOBER 1954
Volume 5 No. 10

ASHEVILLE: 1955

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CHARTS I-XV

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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CLIMATOLOGICAL DATA
NATIONAL SUMMARY

Volume 5 No. 10 OCTOBER 1954

GENERAL SUMMARY OF WEATHER CONDITIONS

While hurricane Hazel was the most notable weather feature of October 1954, the month was also characterized by unusually high temperature ranges and extremes of precipitation. Deficient precipitation prolonged the drought in parts of the Southeast and the western portions of the lower Great Plains, while record rainfall in the lower Great Lakes region resulted in Chicago's worst flood in history. Frequent rains in the North Central Interior during the first half of the month delayed harvesting activities, but fair weather the last half of the month permitted fair to good progress. In the eastern portions of the central and lower Great Plains and the Ohio and central Mississippi Valleys, areas that in September received only slight relief from summer drought, October rainfall furnished adequate topsoil moisture for fall-seeded grains and replenished water supplies.

East of the Rocky Mountains abnormally hot weather that began in June persisted through the first week of October. With a cooler trend thereafter, temperatures had dropped to about normal at midmonth and to unusually low levels for October by the end when freezing and frost occurred in parts of all southern States. The month's sunshine was below normal between the Great Plains and the Appalachians and above elsewhere. Boise, Idaho, had 144 percent of normal for the month and Omaha, Nebr., 57 percent.

PRECIPITATION.--For the nation as a whole October was the first month in 1954 since January with above normal precipitation. The geographic distribution, however, ranged from one-half the normal amounts in most of the area west of the Continental Divide and in North Dakota, some adjacent areas, and a few small scattered sections in the southern portions of the Country east of the Rocky Mountains to more than twice the usual amounts in the lower Great Lakes region, the upper Ohio Valley, and thence southward through western Virginia, central and southeastern North Carolina, and northeastern South Carolina.

In much of the Southeast October rainfall totaled less than an inch and in some sections less than one-half inch, amounts far too small to furnish any substantial relief from the prolonged drought in this area. At Montgomery, Ala., the total rainfall for the period January through October was 20.94 inches which was 24.23 inches below normal. Pensacola, Fla., with a total of 24.58 inches for the same period had a deficiency of 29.01 inches. River stages continued near the minimum of record, water supplies were critically short in some localities, and pastures and fall-seeded crops remained in poor condition.

In most of the western portions of the central and lower Great Plains, rainfall, generally totaling less than 2 inches, was well below normal and had little effect upon the drought. Fall grains and pastures in most of this area were in urgent need of rain at the end of the month.

Moderate to heavy rainfall in eastern portions of the central and lower Great Plains and the Ohio and central Mississippi Valleys was highly beneficial in helping to replenish soil moisture that had been depleted by summer drought. Monthly totals at individual stations ranged up to 19.52 inches at Athens, Tex., 17.65 at Hugo, Okla., 9.45 at Mound Valley, Kans., 14.24 at Horatio, Ark., and 10.27 inches at Warsaw, Mo.

Heavy rainfall along the path of hurricane Hazel relieved drought conditions in northeastern South Carolina, central North Carolina, and central Virginia. The month's rainfall in these areas, more than half of which fell during the passage of Hazel, totaled over 4 inches with top amounts ranging up to 9.66 inches at Georgetown, S. C., 10.25 at Carthage, N. C., and 13.11 inches at Big Meadows, Va.

Record-breaking rains fell in a belt extending from western New York State to northern Illinois and thence northward through eastern Wisconsin. Record monthly totals for October were measured at Green Bay, Wis., 5.00 inches; Chicago, Ill., 12.06 (also a record for any month); South Bend and Fort Wayne, Ind., 9.75 and 9.26 respectively; Grand Rapids, Mich., 8.76; Cleveland, Ohio, 9.50; and Buffalo, N. Y., 9.13 inches. Also, record 24-hour amounts occurred at Green Bay, Wis., 3.55 inches on the 2d and 3d; Detroit, Mich., 3.72 inches on the 3d and 4th; and Cleveland, Ohio, 3.44 inches on the 14th and 15th.

Heavy rains of 3 to over 4 inches on the 3d caused damaging floods in Wisconsin, the Chicago area, and southern Michigan, flooding basements and washing out railway tracks and highways. Damage in Chicago was estimated at $1,000,000, but in other areas the dollar amount of damage has not been determined.

Much heavier rains occurred in the northern portions of illinois and Indiana on the 9th, 10th, and 11th. At a number of points in the Chicago area rainfall on the 9th and 10th exceeded 10 inches, and resulted in Chicago's worst flood in history. Property damage in northeastern Illinois was estimated at $25,000,000 of which $10,000,000 was in Chicago. In northwestern Indiana losses were estimated at $10,000,000 or more.

A flash flood occurred in southeastern New Mexico as a result of heavy rains on the 6th and 7th. In Roswell, 4.30 inches of rain fell on these dates, causing $80,000 property damage. Property and crop losses for all southeastern New Mexico was estimated at $2,500,000.

SNOWFALL.--During the cold weather at the close of the month snowfall was widespread over middle and northern areas east of the Rocky Mountains, although measurable amounts were generally limited to northern localities. A total of 6.1 inches of snow fell on the 30th and 31st at Cleveland, Ohio, establishing a new maximum October record for that station; 2 inches remained on the ground at the end of the month. Measurable amounts fell in the northern Great Plains and upper Mississippi Valley during the third week - 3 inches at Williston, N. Dak., 9.3 inches at Rapid City, S. Dak., and 7 inches at Harrison, Nebr. Snowfall during the month was negligible in the Northeast.

Flurries occurred in the northern Rockies as early as the first 3 days of the month, with the heaviest falls of the month occurring there from the 23d through the 26th. In northeastern Wyoming average snowfall for the month was 9.3 inches. In Colorado the greatest monthly fall was 22 inches at Climax. During the second week snow began to accumulate in the Cascade Mountains where 3 measurable falls occurred during the month, 10 inches falling at Chinook Pass the night of the 12th. Only 6 stations in Oregon reported measurable snow, all above 4,000 feet. Snowfall was negligible in the Sierra Nevada Mountains.

TEMPERATURE.--The month was slightly cooler than normal west of the Great Lakes and in the extreme Southeast, but in the remainder of the Country average temperatures for the month were normal or above, with greatest departures from normal of 4° or more occurring in southeastern Arizona and in coastal areas of southern New England and the Middle Atlantic States.

The hottest weather occurred during the first half of the month, except in the extreme upper Mississippi Valley where highest temperatures were recorded during the fourth week. Unusually hot weather in middle and southern areas east of the Rocky Mountains during the first week was a continuation of an above-normal temperature regime which began there early in June. Maxima established new October records at many stations in the area, among which were Chicago, Ill., 91° and St. Louis, Mo., 92° on the 3d; Atlanta, Ga., 95° and Columbia, S. C., 101° on the 5th; and Raleigh, N. C., 98° on the 6th. Also new October highs were recorded for Georgia (105° at Fort Gains) and Alabama (103° at Troy) on the 5th, and the State high in Mississippi for October of 100° was equaled at Canton on the 2d. The long heat wave in this area was temporarily broken at the end of the first week by a cold air intrusion from Canada, which reduced temperatures by 10° to 30° and was definitely broken about midmonth by another cold air intrusion, with normal to below normal temperatures prevailing during the remainder of the month.

Highest temperatures occurred in the Pacific States, northeastern Texas, the Middle Atlantic States, and parts of New England about midmonth. In California at this time record highs for so late in the season were reported by many stations, among which were Bakersfield 101° and Fresno 97° on the 15th. In the Northeast, Boston, Mass., had a new October high of 90° on the 12th. The month's highest temperature was 106° at Mecca, Calif., on the 16th.

Lowest temperatures occurred during the last week, except in New York and New England where they were recorded at most stations during a brief but sharp cold snap on the 7th and 8th. On the 30th and 31st minima dropped to freezing or lower in interior regions, except in a few extreme southern areas, and were near the minimum of record for October in the Southeast. In this latter area the monthly temperature range for October was unusually high, with Georgia turning in a new record range of 82° (from a high of 105° to a low of 23°). The month's lowest temperature was -3° at Walden, Colo., and Lamar, Wyo., on the 27th.

DESTRUCTIVE STORMS.--During October 1954 storms, other than hurricane Hazel and heavy rains that resulted in damaging flash floods, accounted for at least 8 deaths, over 40 injuries, and property losses valued at more than a million dollars, most of which was caused by three storms.

The first was a severe hailstorm in central Kansas affecting Ellis and western Russell Counties where property losses were estimated at $200,000 and crop losses at $225,000.

The second was a tornado which dipped to earth about 2:15 p.m. on the 11th in the vicinity of Franklin, Ind., killing 2 persons, injuring 10 others, and caused property losses of $200,000.

The third storm was also a tornado. Striking Portland, Tex., on the evening of the 22d, it injured 25 persons and caused an estimated property loss of $400,000.

(See the special article on hurricane Hazel elsewhere in this publication).

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

OCTOBER 1954

Section	Temperature								Precipitation					
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes			
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least
	°F.	°F.		°F			°F.		In.	In.		In.		In.
Alabama	65.8	0.9	Troy	103	5	Rock Mills	21	31	1.37	-1.13	Gulf Shores 2SSE	5.71	Perryville	0.00
Arizona	64.2	2.4	3 Stations	105	2+	Fort Valley	8	28	.36	-.45	Painted Canyon	1.73	21 Stations	.00
Arkansas	63.9	1.0	2 Stations	98	2+	2 Stations	24	30+	4.97	1.74	Horatio	14.24	Parkin	.94
California	61.3	.3	Mecca	106	16	Boca	6	30	.26	-1.04	Gasquet RS	4.50	304 Stations	.00
Colorado	49.5	2.0	Eversoll Ranch	98	3	Walden	-3	27	.97	-.26	Cascade	2.77	Monte Vista	.00
Connecticut	56.2	4.0	4 Stations	88	12	Putnam	19	8	2.43	-1.05	Norwich 5SW	4.59	Hartford Brainerd Fld	1.44
Delaware	60.9	3.3	2 Stations	92	4	3 Stations	29	8+	2.23	-.84	Middletown 2S	2.91	Milford	1.62
Florida	72.3	-.6	Milton Exp. Station	98	5+	Milton Exp. Station	28	31	3.17	-1.08	Fort Lauderdale	10.45	Live Oak 2ESE	.44
Georgia	66.2	.8	Fort Gaines	105	5	2 Stations	20	31	.95	-1.70	Flat Top	4.58	Fitzgerald	.04
Idaho	45.6	-1.8	Grand View	87	6	Gray	0	27	.66	-.76	Wallace	3.61	Grouse	.00
Illinois	56.3	.4	Greenville	97	3	Stockton	20	31	5.22	2.55	Aurora College	14.86	Grafton	2.29
Indiana	56.3	1.1	Evansville	96	4+	Greensburg 3SW	21	31	6.30	3.53	La Porte	18.26	Evansville	2.06
Iowa	51.7	-.8	2 Stations	91	3	Atlantic 1NE	11	31	4.19	1.90	Bloomfield 2N	8.98	Sioux Center	1.28
Kansas	58.2	.5	Minneapolis	101	3	2 Stations	17	31	2.52	.49	Oswego	10.39	Plains	.54
Kentucky	59.2	.7	Williamsburg	96	5	3 Stations	20	31	2.84	.25	Kentucky Dam	6.02	Berea College	.57
Louisiana	69.7	.6	Winnfield	102	6	Many 4NNE	25	30	3.84	.67	Ville Platte 2SW	11.15	Antioch Fire D. Twr	.56
Maine	49.6	1.7	5 Stations	85	1+	Fort Kent	19	26	4.61	1.02	Houlton CAA Airport	6.79	Brunswick	1.44
Maryland	60.1	3.7	2 Stations	96	4	Bittinger 2NW	18	31	3.76	.78	Bittinger 2NW	9.51	Vienna	1.93
Massachusetts	55.8	3.9	3 Stations	90	12+	Birch Hill Dam	18	8	2.59	-.77	Fitchburg	4.27	Nantucket WB Airport	1.29
Michigan	49.5	.7	Three Rivers	84	3	Houghton CAA AP	13	31	5.73	3.08	Niles	12.34	Eagle Harbor	1.41
Minnesota	45.0	-1.0	Zumbrota	78	25	2 Stations	14	18+	1.69	-.15	Theilman	5.93	Roseau Power Plant	.22
Mississippi	66.9	1.4	Canton	100	2	Houston 2NE	25	30	2.60	.12	Standard	6.71	Senatobia	.37
Missouri	58.6	.9	Koshkonong	98	5	5 Stations	20	31	5.35	2.41	Warsaw No. 2	10.27	Bernie	1.99
Montana	43.6	-1.9	Wyola	89	7	Yellowstone PK NE Ent	-1	27	.81	-.18	Summit	3.32	2 Stations	T
Nebraska	50.8	-1.2	3 Stations	96	3+	Fort Robinson	9	27	1.76	.29	Sterling	5.02	Bridgeport	.22
Nevada	52.4	.6	Overton	99	9	Virgin Valley	3	27	.16	-.49	Kimberly	.99	20 Stations	.00
New Hampshire	51.3	3.7	Windham	88	12	Surry Mountain Dam	19	8	2.81	-.31	Pinkham Notch	7.24	Lebanon CAA Airport	1.25
New Jersey	59.0	4.0	Patterson	92	14	2 Stations	21	8	2.25	-1.20	Burlington	3.38	Chatsworth 5S	1.05
New Mexico	57.4	2.2	Jal	100	3	Gavilan	5	20	1.69	.58	Canton	9.84	3 Stations	.00
New York	53.5	3.4	Rifton	92	12	Speculator	10	8	3.15	-.06	Derby 2NW	10.22	Ticonderoga	.83
North Carolina	62.7	2.0	5 Stations	101	5+	Waynesville	16	31	3.63	.45	Carthage 1SSE	10.25	Edneyville	.14
North Dakota	44.0	.0	Marmarth	83	7	Center	10	6	.61	-.43	Watauga, S. Dak. 8N	1.30	2 Stations	T
Ohio	56.0	2.1	2 Stations	92	1+	Cincinnati Hartwell	22	31	5.63	3.13	Willoughby 4N	12.26	Gallipolis 5W	2.15
Oklahoma	65.1	2.0	3 Stations	102	4+	Mutual	21	31	3.05	.09	Hugo	17.65	Elk City 2NE	.12
Oregon	48.2	-2.1	2 Stations	89	14+	Fremont	-2	26	1.63	-.59	Marion Forks FH	8.04	Durkee 3NNW	.02
Pennsylvania	55.6	2.8	3 Stations	90	12+	Clearfield 8NW Nrsy	19	7+	5.36	2.18	Edinboro	11.76	Hop Bottom 2SE	.49
Rhode Island	57.3	3.8	2 Stations	85	2+	Kingston	23	8	2.39	-1.00	Austin	3.31	Block Island WB AP	1.68
South Carolina	65.4	1.2	Little Mountain	103	5	Long Creek	22	31	3.31	.50	Georgetown	9.66	Cleveland 2WNW	.05
South Dakota	46.8	-2.1	Gettysburg	98	8	Deerfield Dam	3	27	1.47	.28	Webster	2.96	2 Stations	.40
Tennessee	60.8	.9	Savannah	97	5	Crossville Exp. Sta.	16	31	2.25	-.52	Newcomb	7.14	Memphis WB Airport	.62
Texas	69.0	2.2	Boquillas Ranger Sta	104	2+	Miami	23	31	3.03	.58	Athens 2SSE	19.52	4 Stations	.00
Utah	51.1	1.7	St George PH	93	7	Ibapah	4	27	.85	-.36	Bryce Canyon NP	3.15	St George PH	.00
Vermont	50.9	3.7	Vernon	88	13	Cavendish	18	8	2.74	-.46	Enosburg Falls	5.65	Springfield	.88
Virginia	60.0	2.5	Boykins	100	6	Big Meadows	16	31	5.07	2.13	Big Meadows	13.11	Olinger	.76
Washington	47.7	-2.4	Battle Ground	87	14	Republic	14	26	2.04	-.74	Quinault RS	13.33	Chief Joseph Dam	T
West Virginia	55.9	1.0	Williamson	94	6	Birch River 6SSW	18	20	5.83	3.05	Pickens 1	12.45	Athens Concord Coll.	1.38
Wisconsin	47.3	-.5	2 Stations	87	3	Necedah 2NNW	11	31	3.93	1.55	Martintown	8.18	Superior	1.13
Wyoming	44.3	-.1	2 Stations	89	2+	Lamar RS	-3	27	.75	-.40	Casper	2.34	Fort Washakie 2S	T
Puerto Rico	76.8	-1.0	Dos Bocas	95	1	Garzas Dam (3)	57	18+	13.16	5.51	Toro Negro Reser.	34.95	Calero Camp	4.31

+ And also on a later date or dates.

Note: Dates in Table 1 apply to the period 24 hours prior to time of observation. In some cases the actual occurrence is on the calendar date preceding that shown. (See individual Climatological Data for times of observations).

CLIMATOLOGICAL DATA

Table 2

OCTOBER 1954

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
ALABAMA																																
Birmingham	610	994.6	1019.9	77	52	64.5	0.8	94	6	30	31	5	2	50	65	1.77	-1.09	0.62	7	2	0.0	0	8.0	ENE	38	NW	27	15	7	9	4.4	67
Mobile	211	1011.9	1019.8	80	58	68.8	-.3	93	5	34	31	5	0	57	75	3.21	-.54	1.86	8	4	.0	0	8.9	N	--	--	---	17	10	4	3.5	--
Montgomery	198	1012.2	1019.6	81	53	67.3	.9	100	6	33	31	8	0	51	64	1.56	-.80	1.12	4	4	.0	0	5.9	NE	25	NW	15	19	9	3	3.2	86
ARIZONA																																
Flagstaff	6993	------	------	66	31	48.5	2.4	75	22	13	28	0	18	--	--	.39	-.57	.71	3	1	.0	0	---	---	--	--	---	24	4	3	1.9	--
Phoenix	1114	973.2	1011.9	90	60	74.9	4.1	99	1+	43	25	20	0	46	38	.12	-.28	.12	2	0	.0	0	4.1	E	*19	WNW	24	28	3	2	1.7	92
Prescott	5014	848.0	1015.1	77	42	59.6	2.6	86	1	27	26+	0	5	--	--	.23	-.45	.20	3	1	.0	0	6.1	SSW	34	SW	24	25	3	3	2.0	90
Tucson	2558	924.8	1011.5	89	60	74.2	4.6	98	1	42	27	19	0	36	29	.02	-.45	.02	1	1	.0	0	6.5	ESE	28	E	15	23	8	2	2.1	92
Winslow	4880	853.0	1014.1	76	43	59.5	3.2	89	1	27	28	0	7	30	38	.35	-.20	.27	2	3	.0	0	7.0	SE	*42	SW	24	28	2	3	1.8	--
Yuma	199	1005.8	1010.7	94	62	77.9	1.5	102	14+	48	25	24	0	41	31	.12	-.20	.12	1	0	.0	0	8.2	N	32	SE	2	28	4	1	1.3	97
ARKANSAS																																
Fort Smith	458	1001.7	1018.4	76	54	64.7	.8	95	3	33	30	5	0	54	73	4.99	1.36	2.27	8	4	T	0	8.3	ENE	28	NE	21	12	9	10	5.0	63
Little Rock	257	1005.8	1018.9	75	55	65.0	.9	94	5	32	30	4	1	53	70	3.64	.83	.82	10	5	.0	0	8.6	SW	37	S	26	10	9	12	5.3	82
Texarkana	361	------	------	78	57	67.2	.2	94	3	34	30	6	0	--	--	5.49	2.11	1.75	9	6	.0	0	---	---	--	--	---	--	--	--	---	--
CALIFORNIA																																
Bakersfield	489	998.0	1016.0	82	51	66.2	-.3	101	15	40	25	3	0	41	43	.00	-.37	.00	0	0	.0	0	4.5	NW	*20	NW	6+	26	3	2	1.2	--
Bishop	4108	875.0	1015.9	79	34	56.5	-.6	93	12	20	25	1	10	--	--	.00	-.34	.00	[illegible]	0	.0	0	---	---	--	--	---	27	1	3	1.4	--
Blue Canyon	5280	840.5	1015.6	63	45	54.0	.9	79	14	29	24	0	1	--	--	.64	-2.53	.56	2	0	.0	0	---	---	--	--	---	23	4	4	2.2	--
Burbank	699	988.2	1013.9	79	51	65.0	-.1	99	15	42	25	4	0	46	58	T	-.52	T	0	0	.0	0	4.0	S	*16	NE	28	17	11	3	3.2	--
Eureka CO	43	1015.9	1018.3	61	47	54.0	-.2	73	18	39	24	0	0	--	--	1.47	-1.23	.54	7	0	.0	0	6.0	---	32	N	23	8	10	13	5.7	56
Fresno	331	1003.4	1015.3	80	47	63.7	-.4	97	15	38	27	2	0	42	50	.00	-.66	.00	0	0	.0	0	4.4	NW	22	NW	19	25	5	1	1.3	97
Los Angeles CO	312	------	------	77	55	65.7	-.9	90	20	51	9	1	0	50	66	T	-.50	T	0	0	.0	0	4.9	---	18	W	28	17	12	2	2.9	82
Los Angeles	99	1010.5	1014.7	71	55	62.6	-.8	84	28	50	25	0	0	52	74	T	-.43	T	0	0	.0	0	5.2	W	†23	NE	27+	13	11	7	4.5	--
Mt. Shasta	3543	894.3	1018.7	65	35	50.1	-.9	80	15	25	26	0	10	--	--	.83	-1.78	.38	4	1	.0	0	---	---	--	--	---	18	8	7	3.6	--
Oakland	3	1016.9	1017.2	72	50	60.9	.9	90	14	42	26	1	0	47	66	.06	-.85	.06	1	0	.0	0	5.8	WNW	*37	NNE	26	17	12	2	2.9	--
Red Bluff	341	1003.7	1016.4	78	49	63.5	-1.6	93	14	39	28	1	0	37	41	.40	-1.09	.40	1	0	.0	0	8.5	NW	33	SE	19	17	9	5	3.1	88
Sacramento	17	1014.9	1015.8	77	47	61.9	-.8	88	15	37	31	0	0	42	53	.01	-.90	.01	1	0	.0	0	7.8	SW	36	NW	23	25	4	2	1.6	90
Sandberg CO	4517	863.5	1013.9	70	49	59.8	1.5	86	11	34	24	0	0	--	--	.00	-.66	.00	0	0	.0	0	---	---	--	---	--	26	5	0	1.2	--
San Diego	19	1011.2	1014.2	72	57	64.2	-.8	79	18+	51	26	0	0	54	72	.00	-.63	.00	0	0	.0	0	5.3	NE	16	NW	15+	19	7	5	3.8	87
San Francisco CO	52	------	------	69	54	61.5	.5	87	14	50	1+	0	0	--	--	.24	-.83	.16	2	0	.0	0	7.5	---	24	W	15	20	10	1	2.7	86
San Francisco	1	1015.9	1016.7	70	47	58.2	-1.2	86	14	39	26	0	0	48	73	.04	-.88	.02	2	0	.0	0	10.2	WNW	35	W	12+	19	11	1	2.7	--
Santa Maria	238	1007.1	1015.9	73	44	58.4	-1.6	83	9+	35	25+	0	0	45	69	T	-.62	T	0	0	.0	0	6.3	W	*23	WNW	19+	21	10	0	2.5	--
COLORADO																																
Alamosa	7534	774.1	1019.9	66	28	47.1	3.0	77	1+	10	31	0	18	--	--	.19	-.39	.07	5	1	.0	0	---	---	--	---	---	19	7	5	2.9	--
Colorado Springs	6173	812.4	1017.8	66	36	50.7	-.7	83	1+	18	27	0	10	28	48	.22	-.41	.21	3	1	.1	T	9.7	NNE	*35	NW	13	20	8	3	2.9	--
Denver	5292	839.5	1017.0	67	38	52.5	1.0	86	2	21	27	0	10	26	44	.06	-.95	.03	4	1	.4	T	9.2	S	29	S	23	16	8	7	4.1	73
Grand Junction	4849	862.9	1017.3	68	42	55.0	.6	80	1+	25	27	0	6	35	50	.83	-.01	.39	8	5	.0	0	8.2	ESE	61	NW	24	18	10	3	3.1	78
Pueblo	4639	858.1	1016.9	70	39	54.5	1.7	89	1	22	31	0	7	35	54	.70	.00	.62	4	2	T	T	6.8	SE	32	N	28	18	8	5	3.3	75
CONNECTICUT																																
Bridgeport	7	1016.9	------	68	51	59.1	4.7	83	4+	36	23+	0	0	--	--	3.23	.40	1.77	5	0	.0	0	---	---	---	---	---	10	7	14	5.5	--
Hartford	169	1011.2	1017.0	68	47	57.2	----	88	12	27	18	0	4	47	73	1.63	-----	.85	7	0	.0	0	9.9	S	44	SE	15	8	7	16	6.1	52
New Haven	6	1013.2	1016.9	66	49	57.5	4.2	82	2	32	23+	0	2	--	--	2.20	-.80	1.28	8	0	.0	0	6.5	---	47	SE	15	10	8	13	5.6	64
DELAWARE																																
Wilmington	73	1014.6	1017.9	70	50	59.6	3.4	87	13+	35	31+	0	0	50	74	2.08	-.91	1.12	9	0	.0	0	7.6	WSW	--	---	---	12	8	11	5.3	--
DIST. OF COLUMBIA																																
Washington CO	72	------	------	72	52	61.9	3.5	92	13+	34	31	3	0	--	--	4.24	1.27	1.85	10	--	.0	0	6.5	---	42	SE	15	--	--	--	---	--
Wash. Nat'l. AP	14	1014.2	1018.2	72	53	62.0	3.8	94	4	34	31	1	0	50	69	4.06	1.21	1.73	8	2	T	0	9.6	SSW	78	SE	15	12	10	9	4.9	83
FLORIDA																																
Apalachicola CO	13	1016.6	1018.0	77	62	69.6	-1.4	86	6+	44	31	0	0	--	--	1.56	-.99	.69	[illegible]	3	.0	0	8.2	---	33	E	7	24	5	2	2.0	87
Daytona Beach	31	1016.3	1017.9	80	62	70.9	-2.5	87	15	41	31	0	0	61	74	4.91	-.98	2.85	10	3	.0	0	10.6	NE	*35	NE	14	17	9	5	3.8	--
Fort Myers	15	1015.9	1016.3	84	65	74.4	-1.9	91	4+	54	17	3	0	65	78	1.82	-2.33	1.00	12	3	.0	0	10.0	ENE	*27	SE	3+	15	11	5	4.1	--
Jacksonville CO	18	------	------	79	61	70.0	-1.3	90	5+	42	31	2	0	--	--	5.95	.82	4.53	9	--	.0	0	----	---	---	---	---	--	--	--	---	--
Jacksonville	24	1017.6	1018.6	81	59	69.8	-1.1	91	4+	39	31	3	0	59	74	6.23	1.52	5.18	9	2	.0	0	9.4	NE	37	E	8	18	9	4	3.5	88
Key West CO	5	1013.9	1014.6	84	74	78.8	-.7	90	3	66	31	1	0	--	--	1.39	-5.39	.58	11	5	.0	0	9.7	---	20	E	23+	11	12	8	5.1	61
Lakeland CO	214	------	------	81	64	72.4	-1.9	89	3	50	31+	0	0	--	--	1.28	-1.25	.82	7	1	.0	0	7.5	---	---	---	---	14	13	4	4.0	59
Miami CO	8	------	------	81	71	76.0	-1.6	88	15	57	31	0	0	--	--	4.84	-3.04	2.23	14	4	.0	0	15.0	---	34	E	1	7	16	8	5.7	82
Miami	8	1013.9	1015.0	84	70	77.2	-.7	91	15	58	31	1	0	67	73	4.24	-3.99	1.98	14	2	.0	0	10.7	ENE	*24	E	26	8	15	10	5.6	--
Miami Beach	9	------	------	83	73	77.9	-.8	92	15	60	31	1	0	--	--	4.28	-2.79	1.63	13	0	.0	0	----	---	---	---	---	5	12	14	---	--
Orlando	106	1013.2	1017.6	81	63	72.1	-2.6	90	4	47	31	1	0	62	78	5.07	1.16	3.30	8	1	.0	0	9.9	N	*25	WNW	15	15	8	8	4.1	--
Pensacola CO	13	1016.6	------	78	61	69.7	-.6	88	2	40	31	0	0	--	--	1.24	-2.64	.51	5	3	.0	0	----	---	25	N	15	--	--	--	---	82
Pensacola CAA AP	118	------	1018.9	--	--	----	----	--	--	--	--	0	0	59	74	----	-----	----	--	--	---	--	9.2	NE	---	---	---	--	--	--	---	--
Tallahassee	64	1016.3	1018.6	81	56	68.3	-.5	92	5	37	31	3	0	55	71	1.79	-.59	.89	5	2	.0	0	4.9	E	---	---	---	15	15	1	3.3	--
Tampa	19	1015.9	1017.4	83	63	73.1	-1.5	92	3	48	31	3	0	62	75	.63	-2.51	.31	5	3	.0	0	9.2	NNE	29	E	2	17	12	2	3.3	85
West Palm Beach	15	1014.6	1015.3	84	71	77.1	-.5	89	15+	56	31	0	0	66	73	2.82	-5.50	.99	12	3	.0	0	14.3	ENE	50	E	1	8	11	12	5.8	--
GEORGIA																																
Atlanta	977	979.0	1020.4	76	53	64.5	1.1	95	6+	31	31	3	1	49	62	.17	-2.43	.14	4	0	.0	0	8.2	NW	47	NW	15	16	12	3	3.9	72
Athens	798	990.5	------	78	51	64.3	.4	98	6+	30	31	4	1	--	--	.25	-2.69	.15	2	0	.0	0	----	---	---	---	---	15	13	3	3.5	--
Augusta	143	1012.5	1019.2	80	49	64.5	-2.2	97	6+	31	31	6	2	52	72	1.39	-1.14	1.12	4	2	.0	0	5.8	NW	*35	E	6	19	9	3	3.3	--
Columbus	385	1005.4	1019.6	80	52	65.7	-.1	96	5	29	31	7	1	--	--	.89	-1.15	.83	3	3	.0	0	----	---	---	---	---	20	7	4	3.0	--
Macon	356	1004.1	1018.8	81	53	67.0	.4	100	5	32	31	7	1	50	60	1.28	-.99	.90	3	2	.0	0	4.3	WNW	32	NW	8	20	9	2	3.0	86
Rome	637	996.6	1019.6	77	47	62.0	-.2	96	5	22	31	7	5	--	--	.52	-2.34	.32	4	1	T	0	----	---	---	---	---	13	11	7	4.2	--
Savannah	48	1016.6	1019.1	78	54	66.0	-1.7	94	5	35	31	3	0	55	73	4.06	1.61	2.54	5	1	.0	0	8.6	NNE	31	NE	7	18	10	3	3.5	79
IDAHO																																
Boise	2842	922.5	1019.0	65	37	50.9	-1.7	83	6	23	25	0	8	29	47	.44	-.50	.28	2	0	.0	0	9.8	SE	50	NW	23	18	10	3	3.2	85
Idaho Falls 46 W CO	4933	851.0	1020.3	61	22	41.2	-2.7	76	7	9	14+	0	27	--	--	.07	-.61	.05	2	0	T	0	7.3	---	‡44	WSW	11	--	--	--	---	--
Idaho Falls 43 NW CO	4780	------	------	60	23	41.4	-2.9	76	7	8	27	0	26	--	--	.12	-.35	.12	2	0	T	0	7.2	---	‡39	SW	11	--	--	--	---	--
Lewiston	1413	967.5	1019.8	63	35	48.9	-3.0	79	7	23	26	0	14	--	--	.36	-.85	.24	6	0	.0	0	----	---	---	---	---	11	8	14	5.3	--
Pocatello	4444	864.9	1019.3	61	32	46.5	-2.8	80	7	22	27	0	19	28	52	1.07	.03	.55	4	0	4.1	3	9.6	SW	54	W	11	14	11	8	4.5	74
ILLINOIS																																
Cairo CO	314	1006.1	------	70	53	61.5	-.5	90	3+	35	30	3	0	--	--	4.00	1.03	2.25	12	3	.0	0	7.6	---	26	SW	11	12	6	13	5.8	52
Chicago	610	994.9	1017.8	63	47	55.3	1.2	91	3	29	3	1	2	44	71	12.06	9.50	5.63	14	3	.1	T	9.6	SSW	38	NW	29	7	10	14	8.4	41
Moline	589	995.9	1018.6	63	43	53.1	-.8	89	3	25	31	0	6	45	77	7.43	5.16	4.89	9	3	T	0	7.9	NW	34	W	12	9	9	13	5.9	49
Peoria	654	995.3	1018.3	65	46	55.4	.7	89	3	27	31	[illegible]	2	45	7[illegible]	3.27	.83	1.28	9	5	T	0	10.5	---	40	S	14	7	11	13	6.2	50
Springfield	587	995.3	1018.8	67	47	56.5	.6	93	3	27	30	1	4	47	75	3.25	.04	1.16	10	4	T	0	12.2	SSW	38	NW	14	7	14	10	5.9	58

See footnotes at end of table.

CLIMATOLOGICAL DATA

Table 2–Continued

OCTOBER 1954

State and station	Elevation (ground)	Pressure: Station	Pressure: Sea level	Temperature: Average maximum	Temperature: Average minimum	Temperature: Average	Temperature: Departure from normal	Temperature: Highest	Temperature: Date	Temperature: Lowest	Temperature: Date	Temperature: No. of days: Max. 90° F. or above	Temperature: No. of days: Min. 32° F. or below	Average dew point	Average relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Greatest in 24 hours	Precipitation: No. of days: .01 inch or more	Precipitation: No. of days: With thunderstorms	Snow, Sleet, Hail: Total	Snow, Sleet, Hail: Max. depth on ground	Wind: Average hourly speed	Wind: Prevailing direction	Wind: Fastest mile: Speed	Wind: Fastest mile: Direction	Wind: Fastest mile: Date	No. of days (sunrise to sunset): Clear	No. of days (sunrise to sunset): Partly cloudy	No. of days (sunrise to sunset): Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
INDIANA																																
Evansville	383	1004.4	1020.1	70	48	58.8	-0.5	92	4	26	31	3	2	50	78	2.16	-0.66	0.55	14	3	T	0	7.7	SSW	34	SW	11+	12	5	14	5.5	56
Fort Wayne	801	986.5	1017.8	63	44	53.8	.6	83	1	26	31	0	4	47	80	9.26	6.64	2.09	15	7	.1	T	11.4	SW	35	W	29	7	7	17	6.6	40
Indianapolis	793	988.8	1019.0	66	46	55.9	.0	90	3	25	31	1	3	48	79	3.92	1.40	1.38	10	5	T	T	10.3	SW	40	NW	11	5	10	16	6.8	58
South Bend	768	989.5	1017.9	62	44	52.8	-.1	81	3	26	31	0	6	46	82	9.75	6.76	3.18	18	6	6.5	2	9.3	SSW	*25	SSW	9+	9	3	19	6.6	--
IOWA																																
Burlington	694	992.6	1018.7	64	44	54.2	-.8	88	3	22	31	0	4	45	76	5.09	2.14	2.05	10	7	1.0	1	9.9	SSW	33	N	29	10	8	13	5.7	65
Des Moines	948	986.8	1018.6	62	43	52.4	-2.1	88	3	21	31	0	5	43	74	3.95	1.75	1.60	14	6	.1	T	13.3	SE	38	NW	29	7	7	17	6.5	49
Dubuque	1065	978.3	1017.8	59	41	50.0	-.9	84	3	19	31	0	7	41	73	4.87	2.67	1.91	12	7	T	0	----	---	--	---	---	10	6	15	6.1	--
Sioux City	1094	976.3	1016.8	59	42	50.4	-2.2	74	10	23	31	0	4	42	76	3.56	2.12	1.43	11	6	T	T	12.3	NNW	43	N	14	5	8	18	7.3	36
KANSAS																																
Concordia CO	1375	967.2	------	68	47	57.5	-.2	94	3	29	31	2	2	--	69	1.97	.25	.87	9	4	.0	0	8.3	---	25	NW	14	9	11	11	5.4	54
Dodge City	2594	928.9	1016.6	70	45	57.3	-.5	95	3	26	31	2	6	44	67	1.51	-.06	.88	2	2	T	T	15.3	N	42	SW	8+	17	7	7	3.8	78
Goodland	3645	889.6	1017.1	66	37	51.1	-1.0	91	1+	20	31	3	12	36	65	1.39	.35	.84	5	3	.5	T	10.3	NNW	*27	NW	9	19	[illegible]	6	3.5	--
Topeka	879	982.1	1017.9	70	49	59.1	1.2	96	3	27	30+	3	2	48	69	3.20	.64	1.10	9	7	.0	0	11.3	SSW	63	NE	11	[illegible]	7	16	6.5	43
Wichita	1321	968.2	1016.8	72	50	61.0	.8	95	3+	29	31	4	1	48	68	2.83	.65	1.37	5	4	.0	0	14.7	S	37	N	4+	11	11	9	5.3	66
KENTUCKY																																
Lexington	979	983.4	1019.6	68	48	58.0	.7	89	4	24	31	0	2	48	73	1.33	-1.11	.44	12	2	.1	T	11.7	S	--	--	---	8	11	12	5.7	--
Louisville CO	457	------	------	70	53	61.2	1.4	91	5	33	31	3	0	--	--	2.93	.45	.70	9	3	T	0	----	---	--	--	---	--	--	--	---	--
Louisville	474	1002.4	1018.7	70	49	59.3	.7	91	5	28	31	3	2	50	75	3.86	1.41	.95	12	3	T	0	7.6	S	34	SE	14	10	9	12	5.6	60
LOUISIANA																																
Baton Rouge	64	1015.2	1018.4	80	59	69.6	.0	93	6	38	31	5	0	59	76	5.57	2.59	2.69	8	4	.0	0	7.6	E	--	--	---	13	12	6	4.4	--
Lake Charles	12	1016.9	1018.1	82	62	71.7	1.4	93	2+	41	30	6	0	60	72	3.62	.18	1.71	6	6	.0	0	8.6	ESE	*35	S	12	11	13	7	4.7	--
New Orleans CO	9	1016.3	------	80	65	72.6	-.2	91	4+	48	31	4	0	--	--	3.76	.10	2.35	8	4	.0	0	6.4	---	20	NW	15	13	11	7	4.4	71
New Orleans	3	1016.3	1018.4	80	62	71.1	-.3	92	4+	41	31	5	0	61	76	5.46	2.28	2.19	9	4	.0	0	8.5	E	*36	N	15	15	11	5	3.7	--
Shreveport	252	1008.8	1018.3	80	59	69.3	1.5	97	6	35	30	7	0	59	74	2.88	-.22	1.00	9	6	T	T	9.0	SE	--	--	---	10	14	7	4.7	73
MAINE																																
Caribou	624	992.6	1015.9	52	37	44.2	2.1	74	1	21	26	0	12	37	78	4.70	+1.23	1.48	14	1	.1	T	10.0	NW	*32	NW	24	4	8	19	7.7	--
Portland	61	1012.5	1016.6	62	42	51.7	3.3	85	1	24	8	0	8	45	80	2.01	-.97	.67	12	0	.0	0	9.2	N	44	SE	16	7	11	13	6.4	53
MARYLAND																																
Baltimore CO	14	------	------	72	55	63.2	3.9	90	12	38	31	1	0	--	--	3.32	-.05	1.07	8	--	---	--	----	---	--	--	---	--	--	--	---	--
Baltimore	146	1013.9	1018.6	70	49	59.6	3.1	92	4	31	31	1	1	49	71	3.24	-.13	1.28	9	1	T	0	9.0	SW	73	SE	15	12	10	9	5.1	59
Frederick	294	------	------	69	46	57.4	.6	90	12	29	8	1	3	--	--	2.85	-.44	1.44	11	--	.0	0	----	---	--	--	---	--	--	--	---	--
MASSACHUSETTS																																
Blue Hill Obs.	636	993.4	1016.9	64	48	55.2	4.1	87	12	32	7	0	1	--	74	3.25	-.19	1.14	11	0	.0	0	14.2	SSW	54	SSE	16	12	8	11	5.4	50
Boston	15	1012.5	1017.0	66	51	58.6	3.6	90	12	37	8+	1	0	47	70	3.58	.79	1.35	10	2	.0	0	11.3	SW	*43	NE	29	8	9	14	6.1	67
Nantucket	43	1016.6	1017.1	63	51	56.6	3.6	73	14	34	8	0	0	51	81	1.29	-2.31	.49	10	0	.0	0	13.7	SW	42	N	20	7	7	17	6.5	58
Pittsfield	1153	------	------	62	43	52.4	4.9	81	12	24	8	0	8	--	--	1.85	-1.08	.63	11	--	.0	0	----	---	--	---	---	--	--	--	---	--
MICHIGAN																																
Alpena CO	587	993.6	------	56	42	49.0	1.1	71	11+	28	31	0	3	--	--	4.20	2.22	1.66	16	3	.2	T	9.[illegible]	---	33	NW	6	[illegible]	10	16	6.9	47
Detroit	619	990.5	1017.3	62	47	54.5	1.6	79	14	30	31	0	1	46	75	7.80	5.51	3.72	16	4	T	0	9.6	W	32	WSW	29	7	5	19	6.7	41
Detroit (Willow Run)	722	988.8	1017.2	62	45	53.9	1.4	79	2	29	31	0	2	45	76	6.13	3.96	2.98	16	5	.2	T	10.1	SW	*28	NNW	15	[illegible]	3	20	6.8	--
East Lansing CO	856	------	------	61	44	52.5	2.0	79	3	26	31	0	5	--	--	4.88	2.43	2.30	16	3	T	0	4.6	---	15	NW	6+	--	--	--	---	41
Escanaba CO	594	993.9	------	54	40	46.8	-.3	72	23	21	31	0	5	--	--	2.91	.87	.95	15	3	T	T	9.[illegible]	---	32	NW	16	8	5	18	6.9	42
Grand Rapids	681	991.9	1017.2	61	43	51.8	1.5	79	3	27	31	0	6	45	81	8.32	5.81	3.59	13	5	.4	T	7.5	SW	31	SW	12	8	5	18	6.7	43
Marquette CO	677	988.8	------	52	39	45.6	-1.9	70	22	24	31	0	4	--	73	3.68	1.42	1.40	15	1	3.0	2	7.6	---	27	N	15+	5	6	20	7.4	43
Muskegon	627	993.9	1017.3	59	44	51.3	1.0	74	3	28	19	0	5	45	80	6.36	3.84	3.21	16	5	T	0	----	---	--	--	--	9	7	15	6.6	--
Sault Ste. Marie	721	993.6	1016.4	52	37	44.7	.3	65	13	25	31	0	10	40	85	4.07	1.09	1.43	12	0	T	T	8.8	WNW	30	NW	6+	4	8	19	7.6	34
MINNESOTA																																
Duluth	1409	975.3	1017.3	50	34	41.8	-2.2	65	22	21	31	0	16	35	81	1.32	-.90	.34	10	0	2.9	3	12.2	NW	47	SW	12	6	5	20	7.2	44
Intern'l Falls	1179	972.9	1016.9	51	30	40.8	-1.1	67	22	18	18+	0	18	33	75	.78	-1.03	.51	7	0	2.5	1	9.6	---	--	--	---	6	8	17	6.9	--
Minneapolis	830	984.1	1018.2	55	40	47.7	-2.7	72	24	21	31	0	7	39	74	1.23	-.42	.36	11	0	.4	T	10.5	NNW	34	W	12	9	3	19	6.5	41
Rochester	1017	979.3	1017.8	55	38	46.7	-2.4	73	25	19	31	0	10	34	64	2.76	1.07	.61	13	4	.8	1	8.1	WNW	--	--	---	10	2	19	6.6	--
St. Cloud	1034	979.0	1017.7	53	35	44.1	-2.5	70	23+	17	31	0	14	38	79	2.23	.59	.74	12	2	T	0	6.3	NW	--	--	---	9	2	20	6.6	--
MISSISSIPPI																																
Jackson	315	1007.1	1019.1	80	55	67.5	1.1	96	5+	34	30	9	0	55	71	1.48	-.70	.90	6	4	.0	0	6.7	S	39	NW	6	12	11	8	4.6	69
Meridian	294	1005.4	------	80	52	66.2	1.5	97	5+	30	31+	8	2	--	--	2.01	-.37	1.06	6	3	.0	0	----	---	--	--	---	17	8	6	3.6	--
Vicksburg CO	234	1009.8	------	77	59	67.9	.2	93	5+	37	30	5	0	--	--	1.72	-.50	.80	6	3	.0	0	7.7	---	32	N	6	12	8	11	5.0	62
MISSOURI																																
Columbia	778	989.8	1018.2	67	49	58.0	-.1	91	3	31	30+	1	2	48	72	4.85	1.64	2.33	11	4	.4	T	9.7	SSW	43	W	15	8	11	12	6.0	50
Kansas City	741	983.1	1018.1	68	51	59.4	-.2	93	3	30	31	1	1	48	69	5.10	2.17	1.63	9	8	T	0	11.0	S	35	SW	10+	7	7	17	6.5	45
St. Joseph	809	------	------	67	48	57.3	-.8	91	3	25	21	1	2	--	--	6.04	3.51	3.48	12	8	T	0	----	---	--	--	---	--	--	--	---	--
St. Louis CO	465	998.3	------	68	52	59.8	-.8	92	3	32	30	1	1	--	--	3.76	.86	1.53	11	5	.5	T	11.[illegible]	---	36	SW	11	8	12	11	5.6	57
St. Louis	552	998.3	1018.8	68	49	58.9	-.5	92	3	30	30	1	3	48	71	3.93	.85	2.05	12	4	T	T	8.[illegible]	NW	--	--	---	9	11	11	5.6	--
Springfield	1265	970.9	1018.5	67	50	58.5	.1	88	3	29	30	0	2	50	77	6.75	3.35	2.78	10	4	.0	0	13.[illegible]	S	38	NW	11	10	8	13	5.6	56
MONTANA																																
Billings	3568	893.3	1018.5	60	36	48.1	-1.1	83	7	26	5+	0	15	29	53	1.15	.01	.86	5	0	8.6	4	12.1	SW	49	NW	11	18	7	6	3.9	74
Glasgow CO	2090	942.8	1018.3	60	32	45.9	-.6	85	7	20	29	0	16	30	59	1.05	.25	.97	2	0	T	T	----	---	--	--	---	13	8	10	4.9	--
Great Falls	3664	890.3	1018.5	56	36	45.8	-2.3	77	7	25	26	0	15	28	55	1.35	.63	1.15	4	1	3.2	3	16.6	SW	61	SW	11	11	12	8	5.1	63
Havre CO	2488	928.2	1018.0	59	35	46.6	-.2	82	7	23	29	0	14	--	--	.48	-.20	.36	4	0	.3	T	8.5	---	38	W	11	9	14	8	5.4	52
Helena	3893	876.1	1020.7	56	29	42.6	-2.5	79	7	20	1+	0	23	28	62	.86	.18	.85	3	0	1.3	1	7.7	W	47	W	11	8	16	7	5.2	77
Kalispell	2965	------	------	53	29	40.8	-3.6	66	7	18	26	0	20	--	--	.50	-.86	.22	6	0	T	T	----	---	--	--	---	7	8	16	6.7	--
Miles City	2629	933.3	1018.8	61	34	47.3	-1.0	83	7	21	29	0	14	32	--	.35	-.59	.21	4	0	1.7	T	8.3	NW	--	--	---	16	8	7	4.2	--
Missoula	3200	905.5	1021.8	55	31	43.0	-1.9	70	7	20	26+	0	18	33	69	.40	-.67	.18	6	0	T	0	4.4	NW	30	NW	11	5	12	14	6.4	66
NEBRASKA																																
Grand Island	1841	950.9	1017.7	62	41	51.6	-2.4	84	9	25	31	0	6	41	73	1.25	-.06	.72	8	3	T	T	12.2	NNW	--	--	---	7	10	14	6.3	--
Lincoln CO	1184	------	------	63	45	54.3	-2.1	86	2	29	30+	0	2	--	--	2.50	.84	.59	11	6	T	0	8.9	---	34	NW	13	7	10	14	6.4	47
Norfolk	1544	961.7	1018.0	60	41	50.3	-1.8	76	8	25	31	0	5	42	76	2.46	1.10	1.17	12	6	T	0	----	---	--	--	---	6	8	17	6.6	--
North Omaha	1323	969.5	------	61	43	52.1	----	83	3	22	31	0	6	--	--	2.34	----	.90	12	2	T	T	----	---	--	--	---	--	--	--	---	--
North Platte	2779	917.7	1017.5	62	36	48.8	-2.9	88	3	18	31	0	13	38	74	1.18	.14	.55	9	3	T	T	12.8	NW	40	N	31	12	8	11	5.2	48
Omaha	978	977.7	1018.0	63	45	53.9	-1.6	86	3	25	31	0	2	45	74	3.12	1.39	1.45	11	6	T	0	11.4	SE	34	NW	14+	6	10	15	6.5	37
Scottsbluff	3950	880.8	1017.8	63	35	48.9	-1.6	85	8	20	31	0	12	32	60	.32	-.69	.25	3	0	.9	1	11.9	WNW	--	--	---	16	7	8	4.1	--
Valentine CO	2581	924.8	------	59	37	47.9	-2.7	88	8	19	27	0	9	--	--	.78	-.39	.60	7	0	T	T	9.3	---	30	W	14+	11	8	12	5.1	65
NEVADA																																
Elko	5075	847.3	1019.2	68	24	45.7	-1.7	80	16	9	27	0	30	20	41	.09	-.72	.09	1	0	T	0	5.5	ENE	*32	W	11	16	10	5	3.5	--
Ely	6257	811.0	1018.6	65	28	46.0	-.9	77	22	12	27	0	24	24	47	.47	-.35	.23	3	0	7.8	5	12.7	---	35	S	7+	20	8	[illegible]	2.[illegible]	84
Las Vegas	2162	947.9	1012.6	84	53	68.4	1.0	95	8	40	25+	9	0	25	22	.02	-.30	.02	1	0	.0	0	8.1	W	*40	NW	23+	26	4	1	1.1	93
Reno	4397	863.9	1018.5	71	29	49.6	-1.1	81	11	17	26+	0	23	26	46	T	-.55	T	0	0	T	0	5.2	WNW	40	SE	19	20	7	[illegible]	2.[illegible]	91

See footnotes at end of table.

CLIMATOLOGICAL DATA

State and station	Elevation (ground)	Pressure		Temperature								No. of days		Average dew point	Average relative humidity	Precipitation			No. of days		Snow, Sleet, Hail		Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below			Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Fastest mile Speed	Fastest mile Direction	Fastest mile Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
NEVADA (Cont'd.)																																
Winnemucca	4299	870.0	1018.9	70	25	47.4	-1.2	80	16	10	28	0	27	21	37	0.11	-0.68	0.11	1	0	T	T	7.5	---	47	W	12	16	11	4	3.6	91
NEW HAMPSHIRE																																
Concord	339	1005.8	1016.7	64	41	52.1	4.1	85	1	21	8	0	11	44	76	2.62	-.18	1.15	9	0	.0	0	5.4	NNW	30	SE	15	7	11	13	6.2	47
Mt. Washington	6262	805.3	1021.3	39	27	32.8	1.1	55	1	8	7	0	20	--	90	9.15	3.25	4.60	16	0	4.9	3	33.3	W	†110	SE	15	3	7	21	7.8	25
NEW JERSEY																																
Atlantic City CO	8	1015.6	1017.6	68	55	61.8	3.8	89	4	40	31+	0	0	--	--	1.67	-1.54	.84	7	3	.0	0	14.9	---	66	SE	15	13	8	10	4.8	74
Newark	11	1016.3	1017.6	70	51	60.4	4.8	89	13	36	31	0	0	48	69	1.75	-1.45	.71	6	0	.0	0	9.9	SW	*48	ESE	15	12	5	14	5.5	--
Trenton CO	56	1010.5	1017.3	68	51	59.9	3.8	86	13	36	31	0	0	--	--	1.78	-.87	.89	6	1	.0	0	8.3	---	*57	S	15	13	5	13	5.4	62
NEW MEXICO																																
Albuquerque	5310	850.0	1014.1	74	49	61.4	3.2	86	1	33	31	0	0	35	42	.25	-.39	.17	2	2	.0	0	7.7	SE	42	S	24	22	6	3	2.5	86
Clayton	4969	849.6	1016.5	69	41	55.4	.3	90	3+	26	30	2	7	--	--	1.88	.58	1.76	3	0	.0	0	----	---	---	---	--	21	6	4	2.7	--
Roswell	3612	894.7	1015.7	77	47	61.7	.8	91	3+	30	28	3	2	43	56	4.44	3.46	3.37	6	3	.0	0	8.6	---	52	S	3	19	6	6	2.9	--
NEW YORK																																
Albany	277	1013.2	1016.8	65	45	54.8	4.1	85	12	25	8	0	8	47	75	1.74	-.47	.42	12	2	T	0	7.6	SSE	42	SE	15	7	12	12	6.4	49
Binghamton	1601	958.0	1017.3	61	44	52.4	4.1	82	12	27	8	0	5	44	74	1.65	-1.39	.37	14	3	T	0	11.3	SSW	72	S	15	4	7	20	7.6	39
Buffalo	693	988.8	1017.2	62	46	53.9	2.7	85	14	32	7	0	1	46	77	9.13	6.84	1.66	17	5	1.0	.5	13.2	SW	63	SW	15	7	7	17	7.0	41
New York CO	10	1006.1	------	68	54	60.9	3.9	85	13+	38	31+	0	0	--	--	2.22	-.82	1.22	7	0	.0	0	12.2	---	113	SE	15	12	9	10	5.1	83
New York	19	1015.9	1017.7	70	55	62.3	4.7	86	13+	39	31	0	0	50	68	2.29	-.62	1.19	7	0	.0	0	11.2	SW	66	SE	15	11	8	12	5.5	--
Rochester	543	998.0	1016.7	63	45	54.1	3.3	86	14	31	8	0	3	47	79	4.53	2.03	1.50	13	3	T	0	7.9	SW	47	S	15+	8	6	17	6.6	40
Schenectady	217	------	------	64	46	55.3	5.0	83	12	32	8	0	1	--	--	1.87	-.79	.55	10	0	.0	0	----	---	---	--	---	16	4	11	4.8	--
Syracuse	424	995.6	1017.7	64	46	55.4	3.0	85	14	29	8	0	1	45	71	1.99	-1.05	.63	10	2	.1	T	8.2	WSW	63	SE	15	7	7	17	6.5	40
NORTH CAROLINA																																
Asheville CO	2203	------	------	70	45	57.4	.4	88	3	25	31	0	3	--	--	2.98	.44	2.13	7	1	T	0	7.0	---	40	NW	15	11	16	4	4.1	76
Asheville	2093	946.2	1020.3	--	--	----	---	--	--	--	--	--	--	45	76	----	----	----	--	--	---	--	3.9	NNW	---	--	--	--	--	--	----	--
Charlotte	753	991.9	1019.4	77	50	63.8	2.3	98	6	32	31	7	1	49	65	2.52	-.47	2.04	5	0	.0	0	7.9	SW	46	NW	15	17	11	3	3.6	82
Greensboro	891	988.2	1020.0	75	47	60.9	1.9	95	5	32	31	6	1	48	69	7.03	4.43	6.24	7	0	.0	0	8.5	SSW	38	NW	15	18	11	2	3.4	88
Hatteras	4	1018.0	1018.6	74	62	67.9	1.6	87	5	49	23+	0	0	60	76	3.28	-.77	1.26	6	3	.0	0	11.7	SSW	56	SE	15	14	8	9	4.3	64
Raleigh	438	1003.4	1019.1	76	50	62.7	1.6	98	6	35	31+	6	0	49	69	4.93	2.11	4.10	5	1	.0	0	8.1	SW	---	--	---	16	12	3	3.6	72
Wilmington	30	1018.0	1019.4	76	53	64.5	-.8	95	5	38	31	3	0	--	--	5.57	2.79	3.85	5	2	.0	0	7.9	---	82	SE	15	19	9	3	2.9	81
Winston-Salem	967	984.4	1019.7	75	49	61.8	2.0	95	5	31	31	5	0	47	63	7.05	3.92	6.24	8	0	.0	0	8.2	NNW	*31	ENE	15+	19	9	3	3.3	--
NORTR DAKOTA																																
Bismarck	1650	956.7	1018.0	56	33	44.6	-1.1	80	8	20	6	0	15	33	68	.41	-.59	.21	6	0	2.1	T	12.1	WNW	54	W	12	9	11	11	5.6	52
Devils Lake CO	1471	963.1	------	54	33	43.4	-.5	75	8	18	31	0	16	--	--	.47	-.79	.19	8	0	1.4	1	9.7	---	34	NW	12	9	11	11	5.3	57
Fargo	895	982.4	1017.6	54	35	44.7	-1.4	70	22	20	6	0	13	35	72	.59	-.67	.25	6	1	T	0	15.0	SSE	57	NW	28	7	10	14	6.3	50
Williston CO	1877	949.2	1017.8	56	35	45.3	-.2	75	7+	23	26+	0	12	34	65	.70	-.07	.47	5	0	3.1	T	8.0	---	29	NW	12	10	10	11	5.6	60
OHIO																																
Akron	1210	980.7	1018.9	62	45	53.5	.5	85	2	27	31	0	6	46	80	8.42	6.03	2.77	16	5	.5	T	9.7	SW	---	--	---	4	7	20	7.3	--
Cincinnati Obs.	761	------	------	68	48	58.0	.6	90	5	28	31	1	2	--	--	4.88	2.69	1.21	15	6	T	0	5.9	---	33	NW	11	--	--	--	---	50
Cincinnati	869	987.1	1019.1	67	47	56.9	.9	88	5+	27	31	0	4	47	74	4.13	1.96	1.44	15	5	T	0	9.5	SSW	32	W	11	5	10	16	6.8	--
Cleveland CO	663	------	------	64	50	57.3	1.8	83	11	33	31	0	0	--	--	8.52	6.15	3.57	13	--	---	--	----	---	---	--	---	--	--	--	---	--
Cleveland	787	990.2	1017.9	65	48	56.2	1.8	84	2	31	31	0	2	48	78	9.50	7.08	3.44	18	6	6.4	3	10.0	SSW	33	SW	11	4	6	[illegible]	7.5	39
Columbus CO	724	------	------	64	51	57.9	1.8	83	2	33	31	0	0	--	--	4.71	2.71	1.59	18	--	T	T	----	---	---	--	---	--	--	--	---	--
Columbus	815	989.5	1019.0	66	46	56.1	1.6	85	11	31	31+	0	4	48	79	5.24	3.06	1.51	18	5	.2	T	8.0	SSW	35	NW	17	4	9	[illegible]	7.2	50
Dayton	1002	982.1	1018.7	65	47	55.8	.7	82	11+	27	31	0	3	48	79	4.28	1.98	1.10	14	4	.1	T	8.8	SSW	56	SW	14	5	6	[illegible]	7.3	55
Portsmouth CO	715	------	------	69	46	57.3	1.3	91	4	29	31	2	4	--	--	3.12	.84	1.08	15	4	T	T	5.0	---	†32	SSW	14	--	--	--	---	--
Sandusky	603	995.6	------	64	50	56.9	1.9	85	2	33	31	0	0	--	--	4.91	2.81	1.00	15	6	T	T	7.3	---	32	SW	14	5	10	16	6.8	41
Toledo	622	994.9	1017.8	64	45	54.3	1.6	84	2	28	31	0	4	48	81	5.04	2.72	2.17	13	5	.1	T	10.5	SW	34	SW	14	8	4	19	6.9	48
Youngstown	1178	975.6	1018.5	63	45	54.3	.4	83	2	28	31	0	6	46	78	8.59	5.82	4.31	13	5	1.8	1	9.2	SW	*43	W	12	4	9	18	7.2	--
OKLAHOMA																																
Oklahoma City	1280	973.9	1017.5	75	53	63.8	.6	92	3+	30	31	4	2	50	67	1.77	-.89	1.43	5	2	T	0	12.9	SSE	54	NW	11	14	8	9	4.4	63
Tulsa	672	992.9	1017.3	76	54	65.3	1.9	95	4	33	30+	5	0	51	65	2.52	-.57	1.43	8	2	.0	0	12.0	S	38	W	11	10	14	7	4.9	72
OREGON																																
Astoria	12	1017.3	1018.4	63	43	52.8	-1.3	78	15	32	24	0	1	47	41	4.44	-1.72	1.05	15	2	T	0	5.[illegible]	SE	---	--	---	10	4	17	8.2	--
Burns CO	4140	875.4	1019.4	64	30	46.9	-.3	77	6	17	27+	0	20	24	45	.16	-.64	.08	3	0	T	0	----	---	---	--	---	16	5	10	4.0	--
Eugene	361	1005.1	1018.8	63	39	50.7	-2.0	71	7	26	26	0	9	--	--	2.74	-.83	.75	10	0	.0	0	----	---	---	--	---	5	11	15	6.8	--
Meacham	4050	------	------	55	34	44.5	-1.0	71	6+	24	26	0	14	--	--	1.37	-1.57	.64	9	0	2.6	T	----	---	---	--	---	11	5	15	5.8	--
Medford	1312	970.5	1018.5	70	38	53.7	-.8	84	15	25	26	0	8	38	63	.51	-1.40	.42	5	0	.0	0	3.0	S	*33	SSE	6	12	9	10	4.9	--
Pendleton	1489	964.8	1019.8	62	39	50.2	-3.4	75	7	29	26	0	8	34	57	.83	-.35	.73	6	0	.0	0	7.4	SE	---	---	---	11	9	11	5.3	--
Portland	22	1013.5	1018.7	63	43	53.1	-1.6	72	7+	32	27	0	1	45	77	3.40	.23	1.21	11	1	.0	0	5.5	ESE	33	S	7	6	5	20	7.1	41
Roseburg	505	1000.0	1019.0	65	38	51.5	----	73	7+	26	24	0	8	--	--	1.34	-1.59	.65	6	0	.0	0	3.5	---	33	S	6	4	11	16	7.0	46
Salem	195	1010.8	1018.5	64	38	51.3	-3.2	75	31	27	26	0	8	44	77	3.45	-.25	1.33	11	1	.0	0	5.7	S	---	---	---	9	7	15	6.2	--
Sexton Summit CO	3836	------	------	58	43	50.8	.5	77	15	30	23	0	2	--	--	1.30	-2.54	.92	9	0	T	T	----	---	---	---	---	12	11	8	4.9	--
PENNSYLVANIA																																
Allentown	376	1004.1	1018.2	67	45	56.3	3.1	85	13+	29	8	0	4	48	77	2.83	-.14	.95	10	0	.0	0	8.2	WSW	---	---	---	11	8	12	5.7	--
Harrisburg	335	1003.7	1018.5	68	48	57.9	2.7	88	12	30	31	0	2	47	70	3.75	.68	1.57	12	2	.0	0	6.5	W	50	E	15	9	7	15	6.4	55
Philadelphia CO	26	------	------	70	54	61.9	3.4	87	12	39	31+	0	0	--	--	1.84	-.77	.92	7	1	.0	0	7.9	---	73	S	15	11	7	13	5.8	47
Philadelphia	13	1013.2	1017.7	71	52	61.2	4.6	88	12	37	7	0	0	50	73	2.40	-.20	1.07	10	1	.0	0	8.9	WSW	*66	SSW	15	11	6	14	5.8	--
Pittsburgh CO	749	------	------	66	50	57.9	2.0	84	14+	34	31+	0	0	--	--	7.79	5.30	3.57	15	--	.2	--	----	---	---	---	---	--	--	--	---	34
Pittsburgh	1151	988.5	1018.8	64	47	55.3	2.3	83	14	30	31+	0	3	47	75	8.20	5.76	3.56	15	3	T	0	10.9	SW	*35	WNW	27	3	11	17	7.3	49
Reading CO	266	1005.8	1017.6	69	51	59.6	3.5	88	12	34	8	0	0	--	--	3.50	.75	1.03	10	2	.0	0	9.6	---	72	SE	15	8	7	16	6.3	46
Scranton CO	746	988.5	1017.6	65	46	55.7	3.1	86	12	29	8	0	1	--	--	1.98	-.96	.63	13	1	T	0	5.9	---	45	SE	15	8	10	13	6.2	52
Williamsport	527	998.6	1018.0	67	45	55.8	2.8	89	12	28	8	0	3	--	--	2.29	-1.08	1.02	12	--	T	T	----	---	*75	ESE	15	5	8	18	6.9	--
RHODE ISLAND																																
Block Island	110	1012.5	1016.7	64	52	58.0	3.5	73	15+	36	8	0	0	--	--	1.68	-1.42	.65	7	1	.0	0	----	---	---	---	---	11	4	16	5.3	--
Providence	55	1011.2	1017.1	67	48	57.5	4.8	85	13+	27	8	0	2	48	73	2.79	-.04	1.70	7	0	.0	0	10.4	SW	*41	SE	18	13	5	13	5.5	52
SOUTH CAROLINA																																
Charleston CO	9	------	------	76	60	68.0	-.2	91	5	42	31	2	0	--	--	5.56	3.12	5.17	5	2	.0	0	9.9	---	45	NW	15	18	10	3	3.3	82
Charleston	41	1017.3	1019.0	79	54	66.4	-.1	94	5	38	31	3	0	55	73	5.81	3.08	5.11	4	3	.0	0	8.7	NNE	---	---	---	16	13	2	3.7	--
Columbia	217	1011.2	1019.2	80	51	65.3	.4	101	5	33	22	7	0	52	69	1.23	-1.19	.98	5	4	.0	0	5.7	SW	---	---	---	18	11	2	3.1	78
Florence	146	1013.5	1019.3	79	52	65.7	1.6	102	6	36	31	7	0	--	--	7.29	5.02	6.36	6	1	.0	0	----	---	---	---	---	18	9	4	3.2	--
Greenville	1018	982.1	1018.9	77	52	64.0	1.5	97	6	29	31	5	1	45	55	.77	-2.69	.34	6	1	.0	0	8.0	W	33	E	7	17	13	1	3.8	82
Spartanburg	801	------	------	77	51	64.1	1.9	95	5	31	31	6	1	--	--	.22	-3.18	.18	4	0	.0	0	6.8	---	35	NW	15	17	12	2	3.4	--
SOUTH DAKOTA																																
Huron	1282	969.9	1017.9	57	36	46.8	-3.2	83	8	23	30	0	10	38	74	1.13	-.13	.72	6	0	.2	T	11.3	SSE	50	NW	14	[illegible]	8	14	6.0	46
Rapid City	3165	902.8	1018.0	58	35	46.8	-2.3	86	8	18	27	0	10	32	62	1.92	.79	.77	5	0	9.3	7	11.6	NNW	45	NW	31	14	7	10	4.8	58
Sioux Falls	1420	965.8	1018.0	56	38	47.1	-2.9	74	8	19	30+	0	10	38	73	1.54	.08	.80	12	3	T	T	11.0	NW	*40	W	12	[illegible]	5	18	6.8	--
TENNESSEE																																
Bristol	1519	965.5	------	71	46	58.3	.4	90	5	27	31+	1	4	--	--	1.81	-.58	.6[illegible]	8	2	T	0	----	---	---	--	---	1[illegible]	7	12	5.3	--
Chattanooga	670	992.6	1020.1	75	49	62.4	1.6	94	5	25	31	4	2	50	73	1.23	-2.01	.91	4	3	T	0	3.1	SSW	2[illegible]	NW	15	1[illegible]	[illegible]	10	5.0	56

See footnotes at end of table.

Table 2–Continued

State and station	Elevation (ground)	Pressure		Temperature								No. of days				Precipitation			No. of days		Snow, Sleet, Hail		Wind		Fastest mile			No. of days (sunrise to sunset)				
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.		#		°F	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
TENNESSEE (Cont'd.)																																
Knoxville	950	985.1	1020.2	73	50	61.5	1.2	90	5+	28	31	2	1	48	65	0.64	-1.99	0.28	8	0	0.0	0	7.2	NE	27	N	7	12	9	10	4.8	62
Memphis CO	271	------	------	74	56	64.8	-.2	92	5+	34	30	3	0	--	--	.66	-2.52	.35	5	--	.0	0	---	---	--	---	--	--	--	--	---	--
Memphis	263	1004.4	1019.3	76	53	64.5	.9	95	5	33	30	4	0	51	68	.62	-2.65	.26	8	2	.0	0	8.7	S	30	NW	15	11	8	20	5.3	61
Nashville	577	1000.0	1019.9	72	51	61.4	-.4	92	5	31	31	3	1	52	74	2.93	.40	1.27	9	4	T	0	5.1	S	35	NW	14	12	9	10	5.1	57
Oak Ridge CO	905	986.1	------	72	48	59.9	1.5	90	5	24	31	1	2	--	--	1.97	-.45	.89	1	2	.0	0	4.0	---	18	NE	6	14	6	11	5.0	--
TEXAS																																
Abilene	1759	955.6	1016.1	79	56	67.8	1.6	97	13	39	31	7	0	51	60	2.04	-.53	.94	7	4	T	0	12.6	S	45	NW	11	19	6	6	3.1	80
Amarillo	3590	888.9	1015.7	75	47	61.1	2.4	93	4	30	27+	3	3	41	54	.73	-1.20	.59	2	1	.0	0	13.9	SW	38	NE	14	20	6	5	2.9	81
Austin	615	995.9	1017.4	85	61	72.8	1.9	96	12	40	30	11	0	58	67	.89	-2.06	.39	6	3	.0	0	9.6	SSE	38	NE	29	15	11	5	4.3	75
Brownsville	16	1013.2	1015.5	84	69	76.4	.4	92	2	55	16	4	0	68	78	10.95	8.00	6.67	11	5	.0	0	9.2	SE	29	NE	15	2	19	10	6.6	70
Corpus Christi	40	1015.6	1016.7	85	67	75.6	1.7	91	3	49	31	7	0	66	76	4.44	1.98	2.55	8	7	.0	0	10.4	SE	46	N	22	8	18	5	5.0	76
Dallas	487	999.3	1017.8	80	60	70.1	1.3	96	12	37	30	6	0	56	67	2.98	.31	1.28	6	3	.0	0	7.8	SE	33	S	11	15	9	7	4.0	72
Del Rio	1091	982.1	1016.1	83	60	71.5	.0	92	2+	40	30	6	0	57	64	2.01	-.19	1.56	5	1	.0	0	9.4	---	30	E	5	15	8	8	4.2	66
El Paso	3920	887.2	1014.0	81	55	67.9	2.7	91	4	41	30	1	0	43	44	.30	-.53	.19	2	1	.0	0	10.2	S	36	SW	25	19	7	5	2.7	90
Fort Worth	544	997.3	1018.0	80	60	69.9	1.4	95	13	38	30+	6	0	55	66	2.35	-.34	.77	5	2	.0	0	13.4	S	*35	N	14	16	9	6	3.9	--
Galveston CO	7	------	------	79	70	74.7	1.1	88	1	52	31	0	0	--	--	4.16	.57	1.39	12	--	.0	0	12.8	---	47	SE	23	--	--	--	---	80
Galveston	5	1015.2	1017.7	80	70	74.8	1.0	88	1	49	31	0	0	65	73	3.91	.07	1.82	11	5	.0	0	10.0	SE	--	--	--	14	12	5	3.9	--
Houston CO	41	1012.2	------	82	65	73.5	.9	92	14	45	31	5	0	--	--	4.91	1.52	2.29	9	6	.0	0	9.7	---	36	SE	4	11	13	7	4.6	75
Houston	50	1014.6	1017.2	82	64	73.0	1.6	93	12+	41	30	5	0	62	74	6.98	3.28	2.86	11	6	.0	0	11.5	ESE	--	--	--	9	16	6	4.7	--
Laredo	500	1000.3	1015.3	88	66	77.0	.5	97	2	46	31	12	0	61	65	2.52	.95	.90	6	2	.0	0	13.2	SE	*45	E	6	13	13	5	4.3	--
Lubbock	3243	904.8	1015.9	76	48	61.9	.7	92	3	30	31	4	1	47	64	2.82	.75	2.66	4	0	.0	0	12.9	SW	*31	NNE	14	19	7	5	3.2	--
Midland	2854	917.7	1015.7	78	54	65.9	-.7	93	13	39	31	5	0	47	56	2.55	.77	1.41	6	4	.0	0	9.3	S	*32	NE	14	22	4	5	2.8	--
Port Arthur	16	1016.6	1017.9	82	62	71.8	1.3	92	3	39	30	6	0	63	78	5.26	2.33	3.57	12	5	.0	0	11.4	E	36	N	14	12	15	4	4.4	73
San Angelo	1903	949.5	1016.4	80	56	68.4	.4	97	12	34	31	4	0	50	57	.44	-1.81	.26	3	1	.0	0	10.1	S	*37	NE	29	20	5	6	3.5	--
San Antonio	792	992.2	1016.7	84	62	73.1	1.8	93	2+	40	30	7	0	57	64	1.98	-.12	.95	7	4	.0	0	8.3	S	34	NE	29	13	12	6	4.1	77
Victoria	110	1012.2	1016.6	84	65	74.3	.7	93	2	44	30	7	0	62	71	4.52	1.64	2.88	11	5	.0	0	7.8	---	†47	NE	22	12	13	6	4.5	--
Waco	500	998.6	1017.2	82	61	71.5	2.1	95	12	38	30	8	0	58	66	2.48	.07	1.70	6	5	.0	0	12.2	S	--	---	--	14	10	7	4.1	--
Wichita Falls	1027	980.0	1016.6	80	57	68.2	2.9	98	13	35	31	7	0	50	57	1.04	-1.74	.88	6	4	.0	0	8.6	S	*29	NNW	14	19	3	9	3.9	--
UTAH																																
Milford	5028	845.9	1017.8	71	32	51.3	1.2	84	7	15	28	0	18	--	--	.23	-.65	.21	2	1	.7	T	----	---	--	---	--	23	2	6	2.5	--
Salt Lake City	4222	869.3	1017.9	67	38	52.3	-.6	87	7	26	27	0	9	35	57	.54	-.80	.24	8	4	T	0	6.9	SE	28	S	11+	21	5	5	2.8	84
VERMONT																																
Burlington	331	1001.7	1016.3	61	43	51.8	3.6	79	13+	28	22+	0	6	45	78	2.83	-.06	.80	15	0	T	0	9.7	S	70	SE	15	4	11	16	7.1	42
VIRGINIA																																
Lynchburg	947	985.4	1019.3	71	48	59.9	2.1	91	5	27	31	1	1	--	--	5.89	3.02	4.98	7	1	T	0	7.5	---	41	N	15	15	8	8	4.4	71
Norfolk	26	1018.3	1019.2	74	55	64.6	3.4	95	4	39	31	2	0	54	73	1.70	-.75	.63	5	3	.0	0	10.2	SW	78	S	15	14	8	9	4.4	76
Richmond	162	1013.2	1019.1	75	50	62.3	3.5	94	4+	32	31	6	1	51	72	4.99	2.38	1.48	8	4	T	0	8.2	SW	68	SE	15	17	5	9	4.0	70
Roanoke	1174	977.7	1019.7	71	47	59.3	1.4	91	5	29	31	1	2	46	67	6.76	3.37	4.95	6	4	.0	0	7.2	NW	--	--	--	13	9	9	4.6	--
WASHINGTON																																
Olympia	190	1010.8	1018.6	59	40	49.2	-1.8	71	15	29	25+	0	8	43	82	3.38	-1.12	1.25	12	3	T	T	4.9	SSW	*33	S	7	2	9	20	7.8	--
Seattle CO	14	------	------	60	47	53.5	-.9	73	15	38	25+	0	0	--	--	1.04	-2.04	.37	8	0	.0	0	8.5	---	41	SE	19	5	9	17	7.4	35
Seattle	14	1018.0	1018.8	--	--	----	----	--	--	--	---	--	--	44	77	----	-----	----	--	--	---	--	7.0	SSE	--	--	--	--	--	--	---	--
Seattle-Tacoma	379	1004.7	1019.0	59	42	50.6	-1.1	76	15	29	26	0	2	45	82	1.91	-1.41	.70	11	1	.0	0	9.5	NNE	--	--	--	4	8	19	7.2	--
Spokane	2357	950.2	1020.0	57	35	46.2	-2.4	67	6	25	29	0	13	34	65	.77	-.56	.63	4	0	.0	0	6.6	NE	34	SW	11	5	15	11	6.3	58
Stampede Pass CO	3958	881.5	1021.2	47	35	41.0	-1.4	60	29	27	24	0	11	--	--	6.10	-3.24	2.25	12	0	9.0	4	---	---	--	--	--	7	5	19	6.9	--
Tatoosh CO	101	1014.2	1017.4	56	48	52.0	.1	67	16	43	29	0	0	46	82	7.09	-1.63	1.53	16	3	T	0	16.6	E	59	SW	19	8	4	19	6.9	38
Walla Walla CO	949	983.4	1019.6	62	43	52.2	-3.0	72	7	33	26	0	0	--	--	.88	-.60	.75	6	0	.0	0	4.7	---	30	SW	11	10	11	10	5.1	63
Walla Walla	1200	------	------	--	--	----	----	--	--	--	--	--	--	38	--	----	-----	----	--	--	---	--	5.2	S	--	--	--	--	--	--	---	--
Yakima	1061	980.4	1020.2	63	32	47.5	-3.1	70	2+	22	26	0	17	35	65	.27	-.35	.26	2	0	.0	0	6.6	WNW	--	--	--	12	5	14	5.7	--
WEST VIRGINIA																																
Charleston	950	984.4	1019.7	68	47	57.8	.4	87	14+	31	21+	0	4	49	77	4.99	2.18	2.15	12	1	T	T	7.5	S	*25	WSW	16	4	11	16	7.2	--
Elkins	1970	------	------	64	40	51.8	.1	81	13+	25	21+	0	12	--	--	8.43	5.57	3.71	12	5	T	T	4.3	---	*20	NW	27	4	8	19	7.5	--
Huntington CO	565	------	------	71	49	59.9	.7	90	4	30	31	1	1	--	--	2.85	.42	1.32	8	--	T	0	---	---	--	---	--	--	--	--	---	--
Parkersburg CO	615	------	------	68	49	58.2	1.3	89	4	31	31	0	1	--	--	6.46	4.34	3.40	15	6	T	T	5.7	---	19	NW	15	5	10	16	6.9	41
Parkersburg	837	------	1019.1	--	--	----	----	--	--	--	--	--	--	49	--	----	----	----	--	--	---	--	7.1	SW	--	---	--	--	--	--	---	--
WISCONSIN																																
Green Bay	689	994.6	1017.4	56	39	47.4	-1.0	72	12	21	31	0	8	40	78	5.00	3.20	3.68	14	4	T	0	8.5	SW	38	SW	28	7	8	16	6.5	44
La Crosse	652	992.6	1017.4	57	41	48.9	-1.9	72	23	23	31	0	6	40	73	4.47	2.54	1.47	12	5	T	T	10.0	S	*30	NW	29	9	5	17	6.5	--
Madison	857	981.7	1017.4	60	41	50.5	.1	82	3	22	31	0	6	42	75	3.72	1.64	1.75	10	3	T	0	8.8	NW	37	NW	14	9	8	14	5.9	55
Milwaukee	675	992.2	1017.5	60	44	52.2	.8	78	3	23	31	0	3	43	74	3.18	1.21	1.39	11	3	T	T	10.6	SW	35	SW	12	9	8	14	6.0	53
WYOMING																																
Casper	5322	838.8	1017.2	59	33	46.2	-.2	80	7	17	29	0	13	27	55	1.36	.25	.39	8	1	8.0	3	14.1	SW	--	---	--	18	6	7	3.7	--
Cheyenne	6139	813.1	1017.2	61	34	47.5	1.1	80	2	17	26	0	12	27	51	.15	-.98	.05	5	2	.5	T	12.4	WNW	49	NW	30	18	8	5	3.5	71
Lander	5563	837.5	1019.3	59	31	45.1	.5	80	7+	15	27	0	18	26	54	.78	-.75	.44	6	0	6.6	4	6.7	---	43	NW	11	17	8	6	3.6	80
Sheridan	3942	886.2	1019.2	60	31	45.7	-.9	85	7	11	27	0	17	--	--	1.07	-.20	.55	8	0	10.2	5	8.8	WNW	49	NW	20	18	6	7	3.8	68
PACIFIC AREA																																
Canton Island	9	1010.8	1011.2	90	78	84.3	.2	94	11+	77	2+	20	0	71	70	.24	-.15	.15	3	0	.0	0	---	---	--	--	--	13	12	6	4.9	--
Hilo	31	1014.6	1015.9	83	67	74.7	.2	85	22	62	30+	0	0	66	78	8.26	-2.76	1.71	22	0	.0	0	5.4	WSW	*22	E	5	5	20	6	5.5	57
Honolulu	7	1016.3	1016.9	84	72	78.1	-.1	86	1+	65	28	0	0	67	68	1.04	-.85	.44	12	0	.0	0	11.7	ENE	32	NE	8	14	15	2	4.4	75
Koror CO	94	1006.4	1010.3	88	75	81.4	.3	91	20	71	1+	8	0	76	84	12.15	-.39	3.85	26	8	.0	0	---	---	--	--	--	3	8	20	7.7	--
Lihue	115	1011.5	1016.8	83	71	77.2	.7	86	1	66	28	0	0	69	77	4.21	-.42	1.35	21	0	.0	0	11.5	NE	27	NE	9	3	22	6	5.8	56
Ponape CO	112	1005.8	1011.0	86	72	79.0	-1.7	92	13	69	14	4	0	74	88	14.65	-1.74	2.20	28	5	.0	0	---	---	-	--	--	1	8	22	8.4	--
Truk (Moen Island)	8	1010.5	1010.8	86	75	80.7	.0	88	4+	72	1	0	0	76	86	12.69	1.66	3.41	21	1	0	0	---	---	--	--	--	1	9	21	8.4	--
Wake Island	11	1013.5	1013.9	86	76	80.6	-.8	88	4+	70	16	0	0	75	80	5.40	-.64	1.51	22	2	.0	0	14.4	E	--	--	--	7	12	12	6.0	--
Yap CO	53	1008.1	1010.0	89	75	81.6	-.3	91	2+	72	1	12	0	77	86	14.06	1.24	1.89	23	2	.0	0	---	---	--	--	--	1	8	22	8.5	--
WEST INDIES																																
San Juan CO	47	------	------	85	75	78.9	-1.2	90	22+	71	14+	2	0	--	--	3.79	-1.48	1.15	16	1	.0	0	---	---	--	--	--	--	--	--	---	--
San Juan, P. R.	9	1011.5	1013.6	86	74	79.7	-.3	90	23	71	19	1	0	72	81	4.22	-1.58	1.48	17	4	.0	0	9.7	SSE	25	S	16+	8	10	13	6.2	69
ALASKA																																
Anchorage	92	995.9	1000.9	46	34	39.8	3.8	60	2	26	18	0	14	33	77	2.02	.15	.88	8	0	8.7	9	5.4	NNE	*28	E	23	5	3	23	7.8	36
Annette	110	1007.8	1012.0	51	41	46.2	-.7	58	16	32	5	0	1	42	86	18.43	4.05	3.68	23	2	T	T	15.1	SE	*43	E	20	4	2	25	8.3	--
Barrow	22	1013.2	1013.8	24	17	20.9	3.8	43	3	8	25	0	31	18	87	.36	-.16	.15	8	0	4.1	5	12.8	---	42	NW	4	0	1	30	9.7	--
Bethel	21	997.0	998.3	41	30	35.4	3.6	65	2	12	22	0	24	33	91	1.07	-.68	.34	11	0	3.8	2	9.5	NE	*28	SSE	24	1	5	25	8.7	--
Cordova	40	1000.7	1002.4	50	35	42.1	1.3	70	1	24	5	1	11	37	84	18.79	3.23	4.69	22	1	T	0	9.0	E	*55	E	23	4	3	24	8.3	--
Fairbanks	436	986.1	1003.3	40	23	31.2	3.7	53	3	11	23	0	30	24	74	.08	-.84	.03	5	0	2.8	1	5.0	N	23	W	4	3	5	23	7.7	--
Juneau	15	1008.5	1009.4	48	37	42.8	.9	61	1	22	5+	0	7	37	72	6.32	-2.15	1.02	24	0	.0	0	8.8	ESE	42	SE	14	5	1	25	8.2	29
Kotzebue	10	1005.4	1006.1	32	22	27.1	1.6	49	2	13	15	0	30	22	80	.04	-.54	.02	3	0	1.5	2	12.3	N	*36	WNW	4	3	5	23	8.2	--
McGrath	334	988.5	1001.1	38	25	31.4	3.8	58	1	12	24	0	29	25	80	.73	-.94	.26	15	0	3.1	2	2.7	N	*18	S	24	3	4	24	8.3	--
Nome	13	1001.7	1002.5	38	27	32.0	2.0	59	1	19	18	0	28	24	72	.04	-1.66	.03	2	0	2.7	1	10.4	NE	32	NE	7	4	4	23	8.1	40
Northway	1713	941.8	1006.0	32	14	22.8	-1.5	47	4+	1	25	0	31	20	88	.21	-.28	.14	4	0	2.7	2	3.5	S	*18	NW	1	5	1	25	8.1	--
St. Paul Island	22	999.0	1000.2	40	32	36.0	-3.1	50	2	23	11	0	21	33	87	3.24	.12	1.32	24	0	7.3	2	----	---	--	---	--	2	10	19	7.7	--
Yakutat	28	1005.1	1006.2	49	35	42.1	.4	57	1	23	7	0	8	39	87	19.50	-.43	3.01	24	0	T	0	11.2	ESE	*52	SE	23	4	1	26	8.6	--

Data from airport unless otherwise specified.
CO indicates data from city office.
* Data entered in column "Fastest Mile" is the fastest mile observed.
This station is not equipped with automatic recording wind instrument.

+ And also on a later date or dates.
† Peak gust.
‡ Maximum hourly average.
# Number of days maximum 70°F or above for Alaskan stations.

HEATING DEGREE DAYS

(Base 65°F.)

Table 3

OCTOBER 1954

State and station	Current season		Normals July through this month
	This month	Period July through this month	
ALABAMA			
Birmingham	157	158	136
Mobile	76	76	28
Montgomery	107	107	69
ARIZONA			
Flagstaff	503	836	956
Phoenix (CO)	12	12	13
Phoenix	14	14	22
Prescott	172	183	295
Tucson	13	13	24
Winslow	195	195	294
Yuma	2	2	0
ARKANSAS			
Ft. Smith	148	149	140
Little Rock	142	142	120
Texarkana	111	111	69
CALIFORNIA			
Bakersfield	40	40	41
Bishop	261	292	308
Blue Canyon	341	648	551
Burbank	63	64	70
Eureka (CO)	332	1082	1114
Fresno	82	82	86
Los Angeles (CO)	30	30	58
Los Angeles	79	82	196
Mt. Shasta (CO)	457	854	682
Oakland	132	360	394
Red Bluff	68	79	59
Sacramento (CO)	77	81	92
Sacramento	107	114	120
Sandberg (CO)	196	270	237
San Diego	35	35	94
San Francisco (CO)	114	639	604
San Francisco	206	540	555
San Jose	106	164	141
Santa Maria	202	480	460
COLORADO			
Alamosa	547	916	1142
Colorado Springs	440	517	575
Denver	395	470	561
Grand Junction	314	349	369
Pueblo	341	369	457
CONNECTICUT			
Bridgeport	238	316	400
Hartford	300	457	499
New Haven	275	401	474
DELAWARE			
Wilmington	249	285	329
DIST. OF COLUMBIA			
Washington (CO)	218	226	263
Washington	209	217	274
FLORIDA			
Apalachicola (CO)	40	40	17
Daytona Beach	32	32	0
Fort Myers	1	1	0
Jacksonville (CO)	50	50	11
Jacksonville	55	55	16
Key West (CO)	0	0	0
Miami (CO)	0	0	0
Int. Airport, Hialeah	0	0	0
Miami Beach	0	0	0
Orlando	15	15	0
Pensacola (CO)	60	60	18
Tallahassee	76	76	31
Tampa	16	16	0
West Palm Beach	0	0	0
GEORGIA			
Athens	151	151	105
Atlanta	145	145	118
Augusta	143	143	59
Columbus	130	130	78
Macon	114	114	63
Rome	209	209	148
Savannah	107	107	38
IDAHO			
Boise	431	628	524
Lewiston	492	668	539
Pocatello	568	802	670
ILLINOIS			
Cairo (CO)	210	213	189
Chicago (CO)	302	331	
Chicago	329	360	440
Chicago University	334	371	
Moline	395	455	467
Peoria	344	380	436
Springfield	332	368	404
INDIANA			
Evansville	289	307	274
Ft. Wayne	380	432	501
Indianapolis	343	373	385
South Bend	394	473	500
IOWA			
Burlington	376	423	419
Des Moines	401	452	471
Dubuque	467	578	629
Keokuk (CO)	313		
IOWA (Cont'd.)			
Sioux City	444	510	558
KANSAS			
Concordia (CO)	291	309	332
Dodge City	299	314	302
Goodland	451	503	508
Topeka (CO)	255	268	284
Topeka	258	271	338
Wichita	223	226	251
KENTUCKY			
Lexington	301	320	315
Louisville (CO)	233	238	247
Louisville	280	293	283
Pikeville (CO)	225	231	
LOUISIANA			
Baton Rouge	69	69	27
Lake Charles	45	45	22
New Orleans (CO)	33	42	5
Int.Airport,Moisant	53	56	7
Shreveport	81	81	53
MAINE			
Caribou	636	1312	1282
Greenville (CO)	534	1112	
Portland	424	785	785
MARYLAND			
Baltimore (CO)	177	179	236
Baltimore	259	282	328
Frederick	299	335	323
MASSACHUSETTS			
Blue Hill Obs.	335	555	
Boston	248	366	399
Nantucket	256	410	539
Pittsfield	416	800	844
MICHIGAN			
Alpena (CO)	489	812	880
Detroit	350	436	485
Detroit (Willow Run)	358	444	499
East Lansing (CO)	393	492	
Escanaba (CO)	556	919	959
Grand Rapids (CO)	374	479	519
Grand Rapids	413	564	649
Marquette (CO)	596	1029	935
Muskegon	423	579	688
Sault Ste. Marie	622	1174	1172
MINNESOTA			
Duluth (CO)	703	1198	1048
Duluth	714	1206	1096
International Falls	745	1331	1260
Minneapolis	530	689	641
Rochester	561	761	743
St. Cloud	641	955	880
MISSISSIPPI			
Jackson	116	116	69
Meridian	135	135	90
Vicksburg (CO)	96	96	51
MISSOURI			
Columbia	286	302	330
Kansas City	247	254	284
St. Joseph	291	312	319
St. Louis (CO)	258	271	240
St. Louis	281	297	278
Springfield	268	279	318
MONTANA			
Billings	518	706	719
Glasgow (CO)	587	878	862
Great Falls	588	945	871
Havre (CO)	566	853	892
Helena	687	1068	1039
Kalispell	744	1333	1095
Miles City	543	731	729
Missoula	677	1136	994
NEBRASKA			
Grand Island	423	476	459
Lincoln (CO)	352	384	396
Norfolk	451	522	561
North Platte	498	577	563
Omaha	359	395	424
Scottsbluff	498	580	593
Valentine (CO)	532	650	627
NEVADA			
Elko	591	964	809
Ely	580	923	855
Las Vegas	63	63	61
Reno	470	779	696
Tonopah	361	451	523
Winnemucca	539	884	705
NEW HAMPSHIRE			
Concord	418	731	787
Mt. Washington	990	3061	
NEW JERSEY			
Atlantic City (CO)	177	193	259
Newark	234	287	348
Trenton (CO)	244	289	340
NEW MEXICO			
Albuquerque	151	154	228
Clayton	314	345	386
Roswell	170	170	164
NEW YORK			
Albany	355	552	606
Binghamton	412	683	789
Buffalo	357	526	601
New York (CO)	213	257	302
La Guardia Field	186	216	278
Rochester	359	562	616
Schenectady	330	503	
Syracuse	331	507	542
NORTH CAROLINA			
Asheville (CO)	297	311	312
Asheville	334	362	
Charlotte	173	173	154
Greensboro	230	234	231
Hatteras (CO)	58	58	63
Raleigh	201	202	165
Wilmington	138	138	73
Winston-Salem	215	216	210
NORTH DAKOTA			
Bismarck	626	917	891
Devils Lake (CO)	658	1165	1038
Fargo	619	902	867
Grand Forks	657	1012	
Pembina	564	852	
Williston (CO)	603	963	937
OHIO			
Akron	393	494	478
Cincinnati (CO)	256	261	264
Cincinnati	328	357	378
Cleveland (CO)	295	335	380
Cleveland	328	378	425
Columbus	346	383	414
Dayton	340	378	403
Sandusky (CO)	306	334	393
Toledo	374	445	501
Youngstown	374	501	457
OKLAHOMA			
Oklahoma City	153	153	168
Tulsa	135	135	170
OREGON			
Astoria	373	935	733
Burns (CO)	553	963	818
Eugene	434	770	592
Meacham	632	1361	1089
Medford	347	500	403
Pendleton	449	597	457
Portland (CO)	285	467	392
Portland	365	627	482
Roseburg	413	666	
Salem	415	728	483
Sexton Summit (CO)	439	1103	782
PENNSYLVANIA			
Allentown	317	408	464
Harrisburg	281	321	377
Philadelphia (CO)	198	216	252
Philadelphia	216	243	316
Pittsburgh (CO)	298	324	354
Pittsburgh	358	429	491
Reading (CO)	252	288	347
Scranton (CO)	338	453	522
Williamsport	327	418	494
RHODE ISLAND			
Block Island	229	332	445
Providence	284	421	514
SOUTH CAROLINA			
Charleston (CO)	68	68	34
Charleston	106	106	52
Columbia	137	137	82
Florence	127	127	94
Greenville	166	166	141
Spartanburg	165	165	143
SOUTH DAKOTA			
Huron	558	671	647
Pierre	541	646	
Rapid City	562	673	749
Sioux Falls	548	666	664
TENNESSEE			
Bristol	286	296	297
Chattanooga	204	207	193
Knoxville	215	216	212
Memphis	164	164	143
Nashville	226	230	176
TEXAS			
Abilene	99	99	103
Amarillo	202	202	277
Austin	40	40	30
Brownsville	0	0	0
Corpus Christi	10	10	0
Dallas	78	78	53
Del Rio	34	34	26
El Paso	46	46	70
Ft. Worth	77	77	58
Galveston (CO)	19	19	0
TEXAS (Cont'd.)			
Galveston	23	23	0
Houston (CO)	30	30	0
Houston	36	36	7
Laredo	6	6	0
Lubbock	188	188	196
Midland	105	105	
Port Arthur	47	47	20
San Angelo	82	82	72
San Antonio	29	29	25
Victoria	19	19	0
Waco	61	61	44
Wichita Falls	92	92	120
UTAH			
Milford	418	514	576
Salt Lake City	399	499	469
VERMONT			
Burlington	427	835	759
VIRGINIA			
Lynchburg	256	265	285
Norfolk	145	149	161
Richmond	220	225	243
Roanoke	268	282	283
WASHINGTON			
Olympia	484	924	815
Seattle (CO)	349	657	557
Seattle	440	909	749
Spokane	574	918	758
Stampede Pass (CO)	739	2043	1626
Tatoosh Island (CO)	397	1259	1304
Walla Walla (CO)	389	478	401
Yakima	535	795	603
WEST VIRGINIA			
Charleston	305	334	310
Elkins	430	548	574
Huntington (CO)	263	275	245
Parkersburg (CO)	306	331	328
WISCONSIN			
Green Bay	536	816	788
La Crosse	491	629	630
Madison (CO)	430	550	596
Madison	452	588	653
Milwaukee	395	508	614
WYOMING			
Casper	580	697	845
Cheyenne	535	692	890
Lander	609	770	906
Sheridan	589	759	885
ALASKA			
Anchorage	775	1749	1939
Annette	577	1391	1397
Barrow	1360	3588	4126
Bethel	911	2242	2327
Cordova	703	1905	1983
Fairbanks	1040	2174	2220
Juneau	681	1747	1850
Kotzebue	1168	2792	2775
McGrath	1035	2285	2352
Nome	1014	2710	2745
Northway	1304	2683	2473
St. Paul	892	2675	2513
Yakutat	702	1947	1979

Data from airport unless otherwise specified.
CO indicates data from city office.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4

OCTOBER 1954

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Franklin, Simpson County, Ky.	1				1	1			Electrical	Fatality and injury caused by being struck by lightning.
Wabasha (near) Minn.	2	4 p.m.			1				do	Hunter killed by lightning on small island near Wabasha.
Cochrane (near), Wis.	2	P.m.			1				do	Lightning struck and killed duck hunter who was standing in 1 foot of water.
Trempealeau County, Wis.	2-3	P.m.-a.m.							Rain	Torrential downpour fell over Trempealeau River Basin. Blair, Wis., recorded official 4.22 inches of rain in 24 hours ending at 7 a.m. October 3. Numerous basements flooded; roads and bridges washed out. Several sections of railroad tracks washed away. Widespread property damage throughout small communities along Trempealeau River--Blair, Whitehall, Arcadia, and near Ettrick.
Green Bay and vicinity, Wis.	2-3	P.m.-a.m.			1	4			do	Torrential rains fell over Green Bay area, establishing new 24-hour rainfall record for month of October. Official 24-hour rainfall was 3.55 inches. Streets flooded; county roads washed out; widespread damage to basements and personal belongings. Large plumbing company in Green Bay estimated that 50 percent of Green Bay's homes suffered at least partial damage from heavy rain and subsequent flooding. Many automobile accidents.
Shoto (near) Manitowoc), Wis.	2-3	P.m.-a.m.				1			do	Heavy runoff from torrential rain over East Twin River Basin swelled river above Shoto, from stream of normal 80 to 90 foot width to 800 feet on October 3. 2 upstream dams held water from village of Shoto. Sluice gates of North Dam opened to relieve water pressure, however, South Dam's gates would not open. To keep South Dam from bursting, National Guard called out to shoot open sluice gates. 3 persons caught in flooded area, only 1 injured due to exposure. Many surrounding farms flooded, delaying fall harvesting and plowing.
Washington County, Wis.	3	1 p.m.							Wind and rain	Severe thunderstorms swept across Washington County. At Village of Kewaskum heaviest damage occurred as nearby barn roof ripped off; chimney over store knocked over crashing through its roof and second floor of building, several store windows blown in, number of trees and large branches blown down, garages moved off their foundations, and many electric lines blown down. Estimated damage in Kewaskum, $15,000. At city of West Bend heavy rains occurred, flooding streets and basements of homes, 1 basement caved in. 24-hour precipitation at West Bend ending at 6:30 p.m. Sunday 3.10 inches.
Chicago, Ill.	3						$1,000,000		Rain	Flooded basements and underpasses.
Michigan, southern portion	3				2				Rain, electrical, and winds	Torrential rains, unequalled at Grand Rapids since 1905, amounting to 4.27 inches in 24 hours, paralyzed highway traffic in many places, knocked out utility services in some areas, and flooded numerous basements. Lightning struck barn near Ionia, causing loss of $10,000. A mother and daughter burned to death when trapped in their home at Union City, as fire resulting from lightning consumed house. High winds felled trees, tangled utility wires, and damaged TV antennas.
Wainwright, Alaska	4	7 a.m.- 2 p.m.							Wind and waves	Storm moving eastward in Arctic Ocean north of Barrow caused high winds along northwestern Alaska coast; a west wind of 57 m.p.h. with gusts to 63 being recorded by Wainwright observer at noon. High winds caused swells and breakers which undermined banks and forced occupants of store building to remove all trade goods. Scow washed away and found later 4 miles to east and half buried in sand.
Wichita, Sedgwick County, Kans.	4	6 p.m.			0	0	40,000	$0	Tornado	Modern school and an older 2-story building damaged. Storm moved southeastward and inspection of damage indicated tornadic action.
Carriacou, Grenadine Islands, British West Indies	5	Evening				1	37,500	5,000	Hurricane Hazel	Hurricane developed from strong easterly wave during day of October 5, and center passed just south of Carriacou Island same evening. Entire island (about 13 square miles) affected; 140 homes destroyed and 240 damaged. Minor damage reported

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Carriacou, Grenadine Island, British West Indies (Cont'd.)										from northern Grenada and from other Grenadine Islands north of Carriacou.
	5									Minor storm also reported at Louisville, Ky.
New Mexico, southeastern portion	6-8				8		[p]$2,500,000		Rain	12,000 acres inundated; more than 300 buildings damaged or destroyed, and considerable damage to roads, bridges, railroads, and municipal property. Major portion of damage to crops, primarily cotton.
St. Augustine, Fla.	7	1 p.m.			0	0	0	$0	Waterspout	Waterspout reported at St. Augustine Beach.
	7									Minor storm also reported near Benson, Ariz.
Washington and Kane Counties, Utah	8	12-2 p.m.		*15-20			65,000	35,000	Rain	Thunderstorm with resulting flooding.
Roosevelt, Utah	8						5,000	10,000	Hail	$2,000 damage to 2 small aircraft (parked outside). Other damage to unharvested alfalfa seed, windows, neon signs, and exterior surfaces of buildings. Some hailstones reported 3 inches in circumference.
	8									Minor storm also reported near Price, Utah.
Montezuma Creek (near Monticello), Utah	9	2:30 p.m.			1				Electrical	14-year old boy and his horse killed by lightning while driving cattle. Apparently thunderstorm was nearby, as it had started to rain.
LaSalle, DeKalb, Kane, Kendall, Cook, DuPage, and Will Counties, Ill.	9-10						25,000,000	100,000	Rain	Near-record heavy rains resulted in major damage over wide area in northeastern Illinois, including Chicago and suburbs. About $10,000,000 of damage occurred in Chicago proper where flooding general, mainly in southern half of city. Number of points received over 10 inches of rain in 2-day period.
Homewood, Ill.	10	4 p.m.	1½	50	0	0	10,000	0	Tornado and rain	Occurred during very heavy rains. Went ½ mile through Ravisloe Country Club, damaging trees and tees; scattered lumber in large lumber yard; did minor structural damage to dwellings.
	10									Minor storm also reported at Houma, La.,
Indiana, northwestern portion	10-11						10,000,000		Rain	Excessive rains caused record flooding along Yellow River at Plymouth and Knox, along Little Calumet at Hammond, Burns Ditch in Ogden Dunes, and along Elkhart River. 24-hour rainfall amounts ranged upward to 5 or 6 inches or more in a few instances, although heaviest rainfalls centered to westward in Illinois. In Indiana alone, however, several thousand persons were evacuated from their homes and damage to business and residential areas heavy.
Ellis and Russell Counties, Kans.	11	3 a.m.	50	*30			200,000	225,000	Hail and wind	Wind-driven hail, stones generally less than ½ inch in diameter, but ranging up to golf-ball size, caused widespread building and crop damage throughout Ellis County and western part of Russell County and hail reported in scattered localities an additional 140 miles eastward to Shawnee County. Pastures and field crops completely destroyed and beaten into ground in Catherine area of Ellis County where hail 3 inches deep. Cattle bruised by hail.
Ellis and Russell Counties, Kans.	11	3 a.m.			0	0	18,000	0	Tornado and hail	Damage from winds accompanying severe hailstorm indicated tornadic action, but funnel not seen. Garage demolished, heavy equipment moved, and sucking effects noticed 4 miles north of Catherine, Ellis County. About 10 miles farther east in Russell County buildings destroyed or unroofed, oil derricks blown down, and pick-up truck tossed 30 feet into air.
Waco, Cherokee County, Kans.	11	4:45 a.m.					15,000		Electrical	Barn and contents burned.
Andale, Sedgwick County, Kans.	11	Day			1				do	Farmer killed while riding tractor.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Mapleton, Bourbon County, Kans.	11	Day				1			Electrical	Farmerly severely burned by lightning strike.
Idaho, southern portion	11	Throughout day							Wind	Strong winds followed fast moving cold front that swept across southern Idaho between early morning and midafternoon. At Tetonia some fields of winter wheat blown out and much topsoil blown from fallow fields. Old timers called it worst blow in history of area. At Sugar wind damage to buildings and at Idaho Falls, where gusts to 72 m.p.h. recorded; some shingles blown off. Potato harvest in that area temporarily halted. Dust clouds delayed traffic on highways and caused several minor accidents. Telephone and power lines temporarily out of order at various points in Snake River Valley. Near Bliss wind blew seed and beans that had not been harvested and badly scattered hay that was in windrows.
Spencer and vicinity, Owen County, Ind.	11	1:30 p.m.				Several	$10,000		do	Several children at Coal City School cut by flying glass from broken windows. Automobiles and power lines damaged by falling trees at Spencer. Basements flooded by 1-3/4 inches of rain within less than an hour. About 10 percent of damage by flash flooding, remainder by wind. Several persons reported what "appeared to be a funnel cloud" south of Spencer and sweeping in an easterly direction, which might have been beginning of Franklin tornado.
Franklin and vicinity, Johnson County, Ind.	11	2:15 p.m.	5	100	2	10	200,000	0	Tornado	Tornado dipped down about 4 miles west-southwest of Franklin destroying church and damaging 2 homes. Funnel lifted to strike again near western edge of Franklin leveling auction barn and injuring several persons. Twister next jumped across Highway 31, completely destroying home, barn, and fatally injuring 2 persons, as well as heavily damaging 30 more homes. Photographs made from air clearly show path of twister through corn fields. Much of path through open fields kept damage relatively low.
Richmond, Wayne County, Ind.	11	3:10 p.m.					100,000		Wind	Wind damaged about 30 homes. Falling trees and tree limbs damaged 100 automobiles. TV antennas bent and broken.
Cherokee County, Kans.	11	Late afternoon							Electrical	Barn 8 miles south of Columbus struck at 6:30 p.m. and burned. Frame house burned at Weir.
Chanute, Neosho County, Kans.	11						20,000		do	Large barn and contents burned.
Waterford (near), Elkhart County, Ind.	11	5:45 p.m.					22,000		Wind	Large chicken house containing 10,000 chickens demolished and hundreds of chickens killed.
Salesville, Palo Pinto County, Tex.	11	6 p.m.	1	440	0	0	1,600		Tornado	Severe damage to roof of only home in path. 3 power poles broken off at ground. Some timber damaged. Path of destruction L-shaped. Moved eastward then northward.
Columbus, Ohio	11	6:30 p.m.	400	300	0	0	1,000	0	do	Tornado developed in open country shortly after sunset and funnel cloud not observed. Debris indicated definite turning of winds. Storm appeared to touch surface only on hilltop where it did some damage to a barn and shed. Farm home near storm not damaged. Occupants of home heard storm approaching and went to basement for shelter. House shook mildly for about 10 seconds.
	11									Minor storms also reported at Louisville, Ky., at Hoyt and Topeka, Kans., and at South Bend, Ind.
Haiti	12	All day			400 to 1000				Hurricane Hazel	After passing Grenadine Islands, hurricane moved generally west-northwestward to latitude 15.5°N, longitude 75.5°W, then recurved to north-northeast and passed over western tips of both Haitian peninsulas on October 12. Several towns almost totally demolished, including Dame Marie, Anse d'Hainault, Mole St. Nicholas, and Jean Rabel. Largest cities of Jeremie, Les Cayes and Port-de-Paix suffered severe damage from hurricane winds. High tides and torrential rains inundated towns along entire south coast. Heavy rains caused most rivers in Haiti to overflow, destroying property,

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Haiti (Cont'd.)										crops, and livestock. Landslide caused by heavy rains destroyed entire village of 200 inhabitants a few days after hurricane.
Puerto Rico	12-15				9		$2,847,137	$2,198,204	Rains	On October 10 an unstable easterly wave passed westward over Puerto Rico, accompanied by moderate to heavy showers. At this time hurricane Hazel began its recurve to north-northeast in direction of Haiti, developing strong shear line to the east. This shear line passed over Puerto Rico on 12th, causing strong southerly flow of very moist air which persisted until 15th, with torrential rains of extraordinary intensity and duration. The excessive precipitation flowed immediately into rivers and dams and severe floods followed. Eastern coastal areas from Carolina and Fajardo south to Salinas, including Humacao, Maunabo, Naguabo, Las Piedras, Yabucoa, and Guayama suffered severe floods on 12th. On 13th, rivers in area from Santa Isabel to Guanica began to rise and by late afternoon and early evening Ponce had 6 feet of water in streets in some sections of city. Other towns in south-central area, including Villalba, Santa Isabel, Jayuya, Adjuntas, Guanica, Orocovis, Yauco, Penuelas, and Juana Diaz, were also flooded. 8 persons killed by drowning and 1 by landslide. More than 550 houses worth about $1,000 each destroyed, and another 1,000 houses damaged. State roads and bridges damaged to extent of $650,000; municipal streets and sewers, $451,000; municipal reserves for repair, $15,459; other government properties, $515,027, making grand total in government losses of $1,631,486.00. In agriculture, sugarcane fields suffered losses amounting to $1,154,854; tobacco, $317,500; farm equipment, $24,850; coffee, $400,000; bananas, citrus fruits, and truck crops, $295,000; pastures, $6,000. Losses of household effects, $299,448; domestic animals, $6,203.
Dominican Republic	12-15								do	Heavy rains attending and following passage of hurricane Hazel over western Haiti caused serious flooding over southwestern portion of Dominican Republic. High tides accompanying hurricane inundated towns along coast.
Galveston (11 miles north-northwest of), Galveston County, Tex.	13	11:59 a.m.			0	0	0		Tornado	Funnel cloud, not touching surface, observed over the Bay by observer at W.B.A.S. Galveston. Moved northward.
Dallas County (northern portion), Iowa	13	7:15 p.m.	3				20,000		Wind	Severe windsquall moved eastward along Highway 141, beginning at highway 169 in vicinity of Gardiner. A dozen farm buildings on 3 farms destroyed or severely damaged.
Freeport (5 miles west of), Barzoria County, Tex.	14	11:30 a.m.			0	0	0		Tornado	Funnel cloud, not touching ground, observed. Moved northward and dissipated in a few minutes.
Ashley, Mich.	14	4:50 p.m.	2	50	0	0	°15,000		Tornado, rain, and electrical	Tornado took roof off house, destroyed country school house, tore off house porch, and lifted shed and garage off ground; then cut path of damage through corn field. 1 person in house and 3 in nearby barn unharmed. Heavy rain and lightning accompanied tornado. Fortunately no students in school house, however, teacher, who was just leaving, saw rear window of her car torn out.
Flint, Mich.	14	6:10 p.m.			0	0	0	0	Tornado and winds	2 fingers of black cloud seen to dip into northern Flint. High winds caused minor damage.
North Carolina, east of 81st meridian	15	6 a.m.- 4 p.m.		*300	19	200	100,000,000	1,000,000	Hurricane Hazel	50 miles of ocean front utterly devastated, 200 miles more badly battered, by winds and tides. Winds recorded near 100 m.p.h. in gusts, and estimated higher near storm center. Center crossed State on northward path somewhat west of 78th meridian. 1,500 homes destroyed, thousands damaged; warehouses and farm buildings destroyed and damaged; millions of trees uprooted and broken.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Pennsylvania, central and eastern portions	15	10 a.m.-10 p.m.							Hurricane Hazel	Center of hurricane reached southern border of Pennsylvania, near Hanover, about 6 p.m., moved northward just west of Harrisburg and Williamsport, and reached northern border (north of Wellsboro) about 9 p.m. 2 separate centers developed in this storm between 5:30 and 7:30 p.m. Winds increased steadily during morning with all sections reporting speeds of at least 40 to 50 m.p.h. Peak gusts shaded from 94 m.p.h. at Philadelphia and 92 at Avoca, to 85 at Reading, 82 at Allentown, 80 at Harrisburg, 75 at Williamsport, 57 at Philipsburg, and 61 at Martinsburg. Peak gusts generally occurred between 6 and 9 p.m. Major damage spotty, but more or less general, in area. Rail and highway traffic delayed or halted by downed trees, wires, and poles. Ships and small craft torn loose from their moorings in Delaware River. High tides and southeast gales on Delaware Bay caused some flooding of low sections in Philadelphia area. Scores of homes and buildings suffered major structural damage, hundreds of others had lesser damage. Hundreds of TV antennas damaged. Thousands of trees uprooted or broken by wind. Apple orchards suffered estimated 1,000,000 bushels of fruit knocked down, hundreds of fruit trees lost. Hundreds of acres of corn flattened and/or twisted, hampering harvest. From about Williamsport south and east, more than 600,000 customers without power at one time or another. Estimated 118,000 telephone subscribers without service for varying periods. Newspaper reports indicated toll of 11 dead and 2 missing for eastern and central sections. Estimate of $1,880,000 damage in Philadelphia area. East-central counties estimated damage near $2,000,000. Elsewhere damage may reach an additional $1,000,000. Latter 2 figures very rough estimates.
South Carolina, eastern portion	15	Morning			1		$25,000,000	$2,000,000	do	Center of hurricane entered coastal area a short distance northeast of Myrtle Beach. Area of extensive damage, as far as South Carolina was concerned, was generally in northeastern coastal area. Excessive rains fell over eastern portion, but very little elsewhere. Horry and Georgetown Counties sustained major part of damage. Lowest sea-level pressure at Myrtle Beach was 28.49 inches at 9:15 a.m. on 15th when winds were from north-northeast at 98 m.p.h. backing by 10 a.m. to southwest at 106 m.p.h. State survey itemized damage by localities as follows: Georgetown, $500,000; Pawleys Island, $1,000,000; McKenzie Beach, $200,000; Garden City, $2,750,000; Surfside, $600,000; Myrtle Beach, $5,000,000; Windy Hill, $2,000,000; Atlantic Beach, $400,000; Crescent Beach, $3,500,000; Ocean Drive Beach and Tilghman's Beach, $500,000; Cherry Grove, $1,750,000; Little River, $100,000.
West Virginia, entire State	15	Most of day					76,000	75,000	do	Record-breaking heavy rains in all areas and high winds over eastern portion associated with eastward movement of north-south cold front over State and northward movement of hurricane Hazel over extreme northeastern portion. Flood damage not included in these totals.
Virginia	15	2-6 p.m.			13	Many, mostly slight	15,000,000	Considerable, mostly minor	do	Widespread wind damage over most of State, worst in Tidewater and Southside Virginia. Torrential rains in Great Valley section which produced considerable topsoil loss in that area, but did knock out dangerous forest-fire threat. 4 of the lives lost were in the capsizing of tug "Indian" in James River off Brandon below Claremont. Estimated that between 17,000 and 18,000 homes and considerable number of farm and business buildings damaged in varying degrees. Number of trees damaged or destroyed was well up in hundreds of thousands, but value difficult to estimate. Huge hackberry tree said to be largest of its kind felled at Tappahannock. Much damage to power and telephone lines; close to half of their individual services in State knocked out for varying periods of time, and it was not until about the 21st that services fully restored. Losses caused in most cases by falling trees and amounted to more than $2,000,000, with overtime wages looming large in calculation. 150-foot microwave telephone tower toppled near Warsaw. 200 plate-glass store fronts in Richmond area broken. About 55 percent of peanut crop hung on poles to dry was blown about with some damage to nuts and

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons: Killed	Number of persons: Injured	Estimated damage: Property (exclusive of crops)	Estimated damage: Crops	Character of storm	Remarks
Virginia (Cont'd.)										the cost of regathering. Truck crops in Eastern Shore and Norfolk areas hit hard, blown over and bruised. Thousands of bushels of apples bruised when blown to ground, but many salvaged. Unharvested corn in eastern sections flattened. Some housed tobacco damaged when barns unroofed. Turkey growers, mostly in Shenandoah Valley, lost between 150 and 250 thousand turkeys, when poultry sheds wrecked. Marine damage ran high. Crab potters almost put out of business, with losses as high as 80 percent of their pots; also losses of pound net equipment. Oyster beds in rivers seriously damaged by being covered with silt or carried away and the industry generally forced to rely largely on shell stock from small undamaged areas. In addition to sinking of tug "Indian", many small craft sunk or drive ashore. Piers demolished and private docks swept away in Tidewater rivers. Number of idle ships of James River Reserve Fleet broke loose from part of their moorings and tangled with other vessels. Battleship "Kentucky" also broke its moorings and ran aground some 1,000 feet from its berth. Tanker broke loose and crashed gate of drydock. Ferry boat carried from its berth several hundred feet into pier. Several planes damaged at Portsmouth, Patrick Henry Airport, and Kellam Field. Installations at Washington National Airport also damaged. Part of cannery at Urbanna washed away. Some disruption of train service due to loss of power for communication facilities. Bus service to east delayed only through discontinuance of ferry service. Air flights cancelled generally shortly after daylight. Dan River overflowed between South Boston and Riverdale and flooded out section of Route 501.
New Jersey, entire State	15	2-10 p.m.			5	Some	$7,500,000	$2,500,000	Hurricane Hazel	Estimate of damage: Residences and buildings $4,000,000 Shade and fruit trees 1,000,000 Public Service Electric and Gas Co 1,300,000 N. J. Bell Telephone Co 1,000,000 Apple crop blown from trees 2,500,000 Miscellaneous 200,000 Deaths caused indirectly by fallen power lines or in traffic accidents in which weather was a factor.
Maryland and Delaware	15				6		40,000,000	Minor	do	Overall damage, mostly by wind to property. Some flash flooding in Garrett County due to 5 to 6 inch rains in 24 hours.
Pennsylvania, western portion	15								do	Heavy frontal rains amounted to 4 to 5 inches (mostly in the 12 hours of 8 a.m. to 8 p.m. on 15th) over a band from western Bedford and northern Fayette Counties to Mercer, Erie, and Warren Counties. Flooding resulted over Allegheny and Monongahela watersheds and in upper reaches of Juniata. High winds, partly from frontal system and partly from hurricane circulation, caused undetermined damage in western counties. Weekend flood in Pittsburgh reached a 32.4-foot stage (7.4 feet above flood stage). Downtown businesses had water in cellars; Baltimore & Ohio Railroad yard on Northside inundated by about 10 feet of water. Turtle Creek, West Newton, Confluence, Connellsville, and Sutersville among cities hardest hit by flood waters. Last 3 cities had severe flooding which apparently exceeded 1936 flood crests by 1 to 3 feet. Newspaper reports indicate that flood damages may be expected to range between 10 and 15 million dollars in the basin (which includes areas outside of Pennsylvania). The American Red Cross furnished the following figures for flood effects in western Pennsylvania: 13 persons killed, 29 injured; 263 homes with major damage, 2,117 with minor damage; 212 other buildings destroyed; 2,929 families suffered loss.
New York, entire State	15	P.m.			21				do	Hurricane Hazel crossed Pennsylvania border into New York State during early evening bringing winds which reached following gust speeds: New York City, 100 m.p.h.; Binghamton, 94 m.p.h.; Buffalo, 83 m.p.h.; and Syracuse over 80 m.p.h. Greatest damage inflicted in south and central portions, but utilities suffered broken services throughout area. 70,000 telephones out, 52,000 in Finger Lakes region. Repair costs estimated at $1,000,000. Disrupted electric services more

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
New York, entire State (Cont'd.)										numerous, but cost of repair unestimated. Buildings damaged, especially roofs. Total loss in Onondaga County, heavy in Syracuse, was placed at $1,000,000 and in southern tier of counties around $2,000,000. Directly and indirectly, storm resulted in 21 deaths and uncounted personal injuries. Accompanying heavy rain in extreme western counties caused flooded streets, highways, and cellars with resultant unestimated loss.
New England, extreme western edge	15-16	Evening of 15th-early a.m. of 16th			1		$35,000		Hurricane Hazel	Center of hurricane passed over western New York, about 225 miles from western boundary of New England. Only extreme western edge of New England experienced damaging winds. Peak gusts reached gale and whole gale force. Woman electrocuted by fallen wire outside her home in Greenwich, Conn. Most localities reported only slight damage, but a few reported considerable damage to roofs, and trees downed carrying power and telephone lines with them. At Pittsfield, Mass., peak gusts in excess of 55 m.p.h. (estimated by W.B.A.S.) toppled many trees, one of which caused damage to home amounting to $2,500. In southwestern Connecticut, nearly 15,000 subscribers without power for about a day.
Sandusky County, Ohio	17								Hail	
Parkersburg and vicinity, W. Va.	19	4-4:30 p.m.					"Thousands of dollars"		Wind and electrical	Fastest mile recorded by Weather Bureau at Parkersburg was 61 m.p.h. from northwest, only 1 mile short of record for station. Many trees uprooted; telephone and power lines blown down; radio antennas overturned; buildings and display signs damaged. Chicken house set on fire by lightning, a total loss including 1,000 chickens within.
Princeton (downtown section), W. Va.	19	9:30-10 p.m.							do	Branches blown off trees and a few trees uprooted; display windows blown in; telephone and light services disrupted; buildings and display signs damaged; 1 house set on fire by lightning.
	19									Minor storms also reported over West Virginia.
Doniphan County (eastern portion), Kans.	20	Early a.m.							Hail and rain	Heavy rain and hail from 3 miles east of Troy to Missouri River Bluffs.
	20									Minor storm also reported at Frankfort, Kans.
Franklin County (southwestern portion), Ark.	21	3:30-4 p.m.	15	*6					Hail	Slight damage to a few house tops. Hailstones averaged 1/4 inch, maximum size 1 inch in diameter. Storm moved northeastward.
Madisonville (near), Madison County, Tex.	22	8 a.m.	12	100	0	0	6,035		Tornado and hail	Struck ½ mile southwest of North Zulch, traveling northeastward; then, rose and struck in Cottonwood community. Unroofed several barns; overturned garages and windmill. Shifted home from foundation and blew out windows. 80 percent tornado and 20 percent hail damage.
Tualatin Valley (about 15 miles west southwest of Portland), Oreg.	22	3:35-3:45 p.m.	½	15	0	0	0	$0	Tornado	A true, but very small tornado, occurred several miles west of Cedar Hills area between Hillsboro and Orenco. Observers not quite in agreement as to whether it actually touched ground or only tops of a few trees. In any event it was only a very few yards in diameter and dissipated in about 10 minutes. It caused no damage. All observers agreed that it was funnel-shaped twister reaching down from black thunderclouds.
Bloomington, Victoria County, Tex.	22	5 p.m.		*1	0	1	10,000		Tornado and hail	Moderate hail, largest size of quarter, damaged cars and roofs. Small buildings overturned and flattened; stadium blown down. Damaged 10 homes and 15 other buildings.
Portland, San Patricio County, Tex.	22	7 p.m.	15	*2	0	25	400,000		do	25 homes destroyed, 250 damaged. 18 other buildings destroyed and 20 damaged. Debris scattered over fields. 44 power poles snapped off at ground. Hail size of golf balls, with largest size of baseballs.

See footnotes at end of table.

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Corpus Christi, Nueces County, Tex.	22	7:35 p.m.					$10,000		Wind and hail	Hail light, largest ½ inch in diameter. Wind blew down signs and power lines, broke shop windows, blew barges loose from moorings, and damaged TV aerials. Storm covered Nueces County and moved southeastward.
	22									Minor storms also reported at Jacksonville, Tex., and over much of northwestern Oregon.
Anchorage and vicinity, Alaska	23	5 a.m.-2 p.m.							Wind	Complex Low was centered near Alaska Peninsula about 600 miles southwest of Anchorage with occluded front extending northeast from center and curving in arc southward into Pacific Ocean. Front passed Anchorage at approximately noon on 23d, roughly 4 hours after most damaging winds occurred. Intense high pressure ridge oriented north-northeast to south-southwest over western Canadian coast contributed to strong pressure gradient that existed over entire coastal area of Gulf of Alaska. Combination of strong pressure gradient and terrain produced winds opposite passes oriented east-southeast to west-northwest such as Turnagain Arm and Knik River Valley that must have been on order of 100 m.p.h. Little damage within city of Anchorage, and strongest wind observed at International Airport was east 28 m.p.h. with gusts to 58 m.p.h. at 1:25 p.m. Damage probably heaviest in Rabbit Creek area where storm blew 1 house down and tore roofs from several buildings, carrying one-half of Rabbit Creek Garage roof about 150 feet. Large spruce and birch trees either uprooted or snapped off, blocking roads and knocking down powerlines. Damage to Chugach Electric Association power system south of Anchorage placed at $30,000. 2 float planes at Lske Hood suffered major damage and National Guard encampment at Fort Richardson nearly levelled by winds. Trees also snapped off or uprooted in Knik River Valley area. House at Mile 38 on Glenn Highway blown down, with slight injury to family.
Kingsdown, Ford County, Kans.	25	5 p.m.	3		0	0	0	$0	Dust devil	Apparently an unusually large dust devil, not pendant from clouds.
Fargo (7 miles south of), Okla.	25	6:30 p.m.	7	1,500	0	0	500	0	Tornado and hail	Tornado moved northeastward. Hailstones 1/4 to 1/2 inch in diameter covered ground to depth of 2 inches in some places.
Wichita, Sedgwick County, Kans.	26	12:05 a.m.	Short	10	0	0	4,000	0	Tornado	New house partially unroofed, with loosened timbers from structure splintered into shreds and strewed along path 100 feet long. Nearby structures and large objects not disturbed. Moved southeastward.

* Miles instead of yards.

° Crop damage included with other property damage.

THE STORM OF OCTOBER 15, 1954

HURRICANE HAZEL OCTOBER 5-21, 1954

By L. H. Seamon

The passage of hurricane Hazel was the outstanding weather feature in the United States during October 1954. With an intensity even greater than that of Carol which dealt New England its most devastating blow in history on the last day of the preceding August, Hazel struck the coast where the two Carolinas join with winds estimated at 130 m.p.h. or more. Wind and waves caused almost complete destruction along the ocean front near the center. Picking up speed the storm raced through central North Carolina, Virginia, Maryland, Pennsylvania, and western New York into Canada in little more than 12 hours, leaving a 200-mile wide belt of light to heavy wind damage and a smaller belt of heavy rainfall which was responsible for destructive floods in western Pennsylvania (see map on next page). Attributed to the storm were at least 93 deaths and several hundred injuries (200 in North Carolina alone). Property and crop losses, although never fully evaluated in many sections particularly rural areas, totaled more than $250,000,000.

While Hazel's passage through the United States was the highlight of her long and evil career, her destructive force was also felt in the islands of Curacao and Haiti as she crossed the Caribbean and in the Toronto area of Canada in the form of floods after leaving the United States.

PATH OF THE STORM.--Hazel's history, spanning 17 days during which she covered thousands of miles from the Tropics to the Arctic region, began on October 5 in the southeastern Caribbean Sea where she was first spotted as a small hurricane near the island of Grenada, which lies just north of the South American Coast. Moving westward in a zigzag course she passed near the Netherlands Islands of Bonaire, Aruba, and Curacao on the 7th. During the next 3 days her forward speed, which had varied from 10 to 18 m.p.h. on the 5th, 6th, and 7th, ranged from 3 to 6 m.p.h. and winds near the center were estimated at 115 m.p.h. or more. On the 8th, the storm had developed such violent turbulence that a crewman on an observation plane was injured on a flight into the storm. At 11 p.m., October 10, Hazel was located at Lat. 15° 6'N., Long. 75° 9'W., or about 180 miles south-southeast of Kingston, Jamaica, where she had remained almost stationary for several hours. At 5 a.m. on the 11th, Hazel had changed course to north-northeast and was moving about 8 m.p.h., her center, located at Lat. 16° 4'N., Long. 75° 1'W., or about 260 miles southwest of Port Au Prince, Haiti; Haiti was advised to prepare for hurricane force winds, torrential rains, and high tides. Early on the 12th the center passed over western Haiti with devastating effects, winds, rain, and floods taking hundreds of lives and causing property and crop losses estimated at millions of dollars. Hazel lost much strength in her passage over the mountainous terrain of western Haiti, and the next day when she passed directly over one of the Bahama Islands the highest wind recorded there was only 40 m.p.h.

At 5 a.m. on the 14th, Hazel had regained full hurricane strength and was centered at Lat. 24° 8'N., Long. 74° 3'W., or about 50 miles north-northeast of San Salvador, Bahamas, headed north-northwestward toward the United States at 17 m.p.h. Hazel's accelerating speed and direction now and during her movement to and across the United States were mainly determined by the blocking effect of high pressure over the North Atlantic and an eastward moving low pressure trough over the central United States.

The center of the storm struck the coast just north of the border of the two Carolinas sometime after 9 a.m. on the 15th. Captain Julian Fulford of the shrimp boat "Nina Fay" which was in the vicinity of Holden Beach reported the "eye" passed about 11 a.m., with time of passage about 10 or 15 minutes. At Ocean Isle most people estimated time of passage for the "eye" at 10 minutes. Captain LeRoy Kinlaw of the fishing boat "Judy Ninda" at Tilgham Point stated that his boat was in the "eye" at 10:30 a.m., and estimated the time of passage at 30 minutes. There was general agreement among people in the "eye" that the rain ended, clouds thinned but not enough to permit sunshine, and that there was little or no wind. As the hurricane continued northward through North Carolina the "eye" passed over Shalotte and Bolton and slightly east of Whiteville and Clinton, west of Goldsboro, Wilson and Nashville, and across the northern border in or near Warren County into Virginia. Through most of the State the "eye" appeared to be 20 to 30 miles in width.

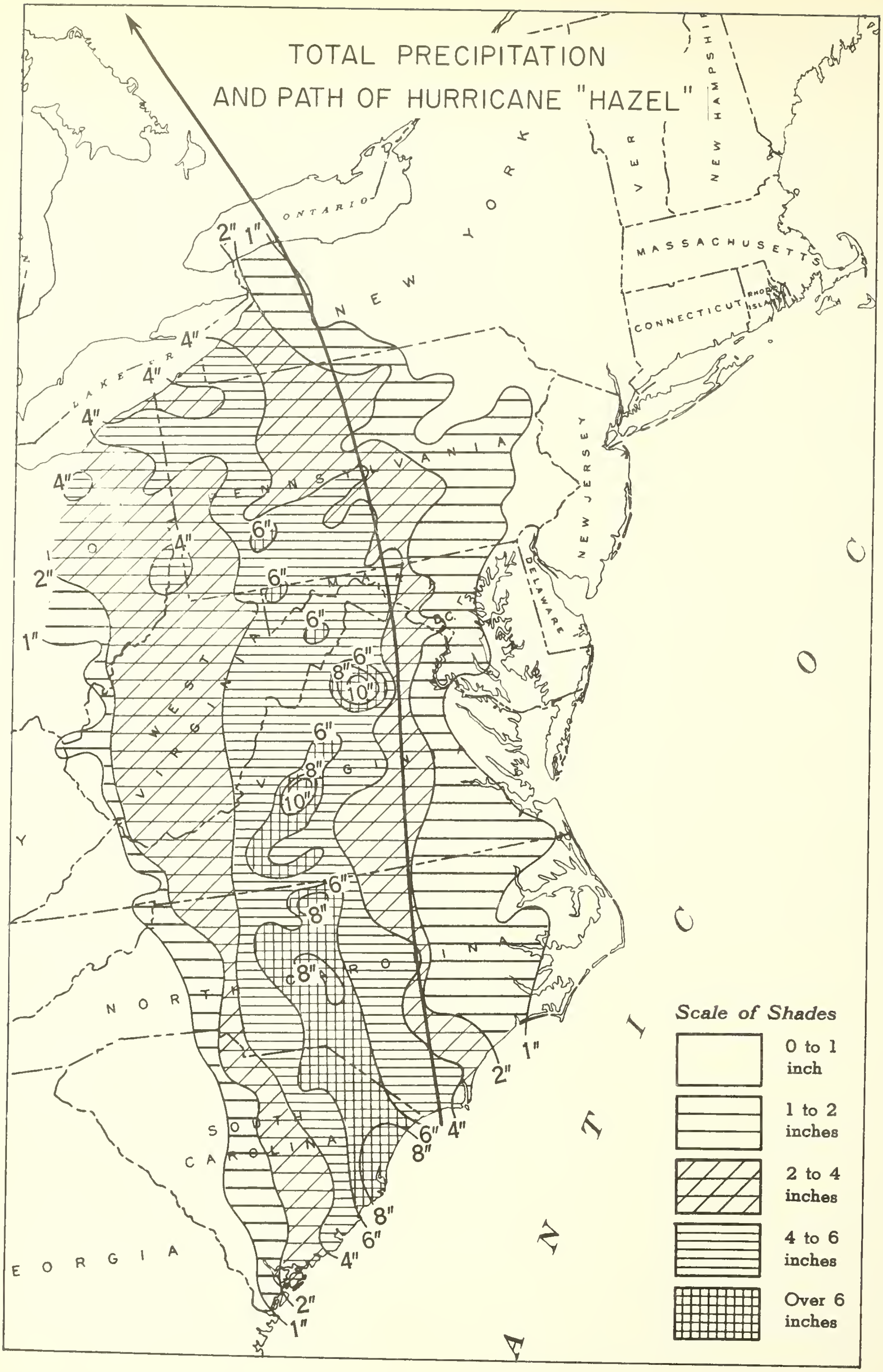
The center, while crossing Virginia from Brunswick County to Loudoun County between 2 and 6 p.m., passed near Fredericksburg, Va., and just west of Washington, D.C. Its path through Maryland lay near Frederick and Hagerstown. The "eye" apparently was not well defined in Pennsylvania and New York since the storm had now become an intense extratropical cyclone, although momentary gusts still exceeded hurricane force. The frontal system from the west already had been drawn into the hurricane circulation before reaching Pennsylvania, probably somewhere during its passage through North Carolina or Virginia. An observer at Shippensburg, Pa., reported the "eye" passed over that station between 6:30 and 6:50 p.m., but mentioned no other details. At the Williamsport, Pa., Airport the wind was near calm for several minutes about 8:25 p.m., but this was not considered the "eye" of the storm because it occurred too long after the barometer began to rise. The center may have moved northward a short distance east of the station at 7:40 p.m. when the pressure began a rapid rise, although this was not indicated by the wind shift which changed from east to steady east-southeast.

The center of the storm, moving at express train speed, crossed New York State in the vicinity of Binghamton and Buffalo and shortly after 9 p.m. had roared over Lake Ontario into Canada.

After passing into Canada where heavy rains and floods resulted in about 100 deaths and $100,000,000 damage, the storm was traced northward to near the southeastern shore of Hudson Bay, from whence it swung eastward, crossed the southern tip of Greenland on the 19th and was last reported somewhere north of Sweden on the 21st.

DAMAGE

NORTH CAROLINA.--More than one-half of the total damage in the United States occurred in this State. From the South Carolina line to Cape Fear the immediate ocean front was almost completely devastated by wind driven tides. The meteorologist in charge at Raleigh, gives the following description of destruction along this portion of the beach: "All traces of civilization on that portion of the immediate water front between the State line and Cape Fear were practically annihilated. Grass-



TOTAL PRECIPITATION AND PATH OF HURRICANE "HAZEL" covered dunes some 10 to 20 feet high along and behind which beach homes had been built in a continuous line 5 miles long simply disappeared, dunes, houses and all. The paved roadway along which the houses were built was partially washed away and partially buried beneath several feet of sand. The greater part of the material from which the houses had been built was washed from one to two hundred yards back into the edge of low-lying woods which cover the leeward side of the islands. Some of this material is identifiable as having been parts of houses, but the greater portion of it was ground to unrecognizable splinters and bits of masonry. Of the 357 buildings which existed on Long Beach, 352 were totally destroyed and the other 5 damaged. Similar conditions prevailed on Holden Beach, Ocean Isle, Robinson Beach, and Colonial Beach. In most cases it is impossible to tell where the buildings stood. Where grassy dunes stood there is now only flat, white, sandy beach."

Hazel was the worst hurricane during the past century to strike the Cape Fear area where old records and reports indicate that not more than eight of these destructive storms have occurred here since 1740.

From Cape Fear to Cape Lookout property damage along the ocean front probably averaged about 50 percent, but it was generally much lighter beyond that point. At Wilmington the Reserve Fleet ("mothball fleet") broke loose and losses were estimated at $1,000,000.

Beyond the rising waters along the coast, damage was nearly all due to wind. Thirty counties in the eastern part of the State reported damaged school buildings, and it has been estimated that nearly one-third of all buildings east of the 80th parallel suffered to some degree. Roofs and television aerials were most widely hit, but some radio towers, outdoor theaters, and many signboards were counted among the losses. A 396-foot radio tower of station WCBT was blown over at Roanoke Rapids, and a number of bridges were damaged beyond immediate use, the largest being the span between Moorehead City and Beaufort. All eastern airports including over 100 small aircraft suffered some loss. Power and communication lines were knocked out over a wide area. In Wilmington one-half of the telephones (10,500) were out, and all electric service was cut off and not fully restored for 3 days in the city and over 2 weeks in suburban areas. Crop losses were estimated at $1,000,000, the corn crop sustaining the greatest damage.

Countless shade and timber trees were blown down, many falling on power and telephone lines disrupting service and others damaging homes. In some forest areas 50-foot swaths of trees were twisted off at 10 to 20 feet above the ground indicating possible tornadic action. Another interesting note regarding wind action in this area was the report that a majority of trees on both sides of the storm path were blown to the east. The meterologist in charge at Raleigh believed this occurrence was due to the simultaneous arrival of the cold front and hurricane center, since highest winds at the Raleigh airport were recorded with the passage of the cold front, blowing from the north-northwest. However, there were many cases in an area from about 10 miles west to 20 miles east of the center where trees fell in both directions, overlapping each other.

The death toll in the State was 19, mostly near or along the beaches, and injuries were estimated at 200. Total losses were estimated at $136,000,000, $36,000,000 occurring along the coast. More than 1,500 homes, mostly on southern beaches, in the State were believed totally destroyed. The Carolina Power and Light Company's losses in the two Carolinas, mostly in eastern North Carolina, were estimated to be between $1,500,000 and $2,000,000. At Wrightsville Beach 89 houses were destroyed and 530 damaged, with total losses estimated at $3,000,000. One-half of the taxable wealth was lost at Carolina Beach where 475 houses were destroyed and 1,365 damaged. Damage at Southport was estimated at $5,000,000. Long Beach was completely destroyed with all of its 300 houses gone, as was Holden Beach which lost all of its 200 houses, and Ocean Isle where no houses remained.

SOUTH CAROLINA.--The storm was blamed for one death and only minor crop losses in this State. Most property damage occurred in Georgetown and Horry Counties, particularly along the beaches with devastation from Pawley's Island to the North Carolina line similar to that which occurred from that point to Cape Fear, N.C.; but damage was heavy as far south as Georgetown, and mostly minor beyond that point. Most damage along the ocean front as in North Carolina was caused by water which came in on 20-foot waves on a high tide of 10 or 11 feet. Hundreds of buildings were destroyed and even building lots eliminated by the waves. Loss of business revenue was not too great, since the storm hit after the summer season had ended and before the start of winter traffic to Florida. As in North Carolina ruined real estate will result in considerable tax loss to beach communities. Estimated damages at beach communities or coastal towns were: Georgetown, $500,000; Pawley's Island, $1,000,000; McKenzie Beach, $200,000; Garden City, $2,750,000; Surfside, $600,000; Myrtle Beach, $5,000,000; Windy Hill, $2,000,000; Atlantic Beach, $400,000; Crescent Beach $3,500,000; Ocean Drive Beach and Tilghman's Beach, $500,000; Cherry Grove, $1,750,000; and Little River, $100,000. Total losses for the State totaled $27,000,000, all occurring along the coast except $2,000,000 in the interior.

VIRGINIA.--The worst damage occurred in Tidewater and southside Virginia. About 18,000 homes and a considerable number of farm and business buildings were damaged, and hundreds of thousands of trees were downed. Broken power and telephone lines cut off about one-half of the users of these services for periods ranging up to 6 days, with losses from this source estimated at more than $2,000,000. A 150-foot microwave telephone tower was toppled near Warsaw. In Richmond 200 plate glass store fronts were broken, 2,500 customers were without power which was not fully restored for a week, and 5,000 telephones were out for varying periods. Crop losses were considerable but not estimated. Between 150,000 and 250,000 turkeys were lost, mostly in the Shenandoah Valley where poultry sheds were wrecked. Crab potters on the coast lost as much as 80 percent of their pots. Oyster beds in the rivers were damaged by being covered with silt or carried away. A tug was sunk, many small craft were driven ashore, and a number of other ships broke from their moorings. Several planes were damaged at Portsmouth. Thirteen lives were lost and many persons were injured in the State, and total damage was set at $15,000,000, of which over $1,000,000 was in

Richmond.

DISTRICT OF COLUMBIA.--The Potomac Electric Power Company reported 1,500 wires down and of 300,000 customers 90,000 to 100,000 were without power for varying periods, and that cost of repairs amounted to $250,000. The Chesapeake and Potomac Telephone Company reported 4,700 telephones out, most of them for short periods, and that cost of restoring service was estimated at $250,000. The Department of Sanitation was out $50,000 for the removal and replacement of trees blown down, and similar losses cost the National Arboretum $45,000. Thus, total damage in the District was at least $595,000. Three deaths were attributed to the storm. The National Airport which is just across the Potomac in Virginia reported damage estimated at $50,497.

MARYLAND AND DELAWARE.--For these two States there were 6 deaths, an unestimated number of injuries, and the value of property destroyed or damaged was estimated between $35,000,000 and $40,000,000. Greatest losses were poultry houses and tobacco barns. In Maryland about 500 of the latter and contents of 300,000 pounds of tobacco were destroyed and an additional 500 damaged, with total losses estimated at $1,200,000. Poultry interests suffered even greater losses, with 25 to 50 percent of all poultry houses being destroyed in Delaware where losses of poultry houses, poultry, and other farm buildings were estimated at $15,000,000 while similar losses in Maryland were placed at $9,000,000. Three percent of Delaware's and 5 percent of Maryland's apple crop was lost, representing values of $60,000 and $100,000 respectively. Widespread damage to homes from wind and falling tree limbs probably amounted to $8,000,000 or $10,000,000. Estimates of damage to boats, mostly on Maryland's lower Eastern Shore, ranged from $300,000 to as much as $3,000,000 and to docking facilities about $1,000,000. Bridge and road damage probably was $300,000 to $400,000. Estimates of damage to coastal farm land by salt from spray and flooding and by erosion was $1,000,000 to $1,500,000, tree loss, timber and shade, and cost of clearing $500,000, and utility damage $1,461,000. The Consolidated Gas, Electric Light and Power Co. of Baltimore reported wires down at 1,800 different locations and that 150,000 customers were without service. The Chesapeake and Potomac Telephone Company of Baltimore City reported 1,581 cases of trees falling across lines in Maryland, 500 in Delaware, and 580 cases of power lines dropping across cables and wires in Maryland and 151 in Delaware.

PENNSYLVANIA.--Wind damage was mainly limited to the eastern half of the State, where one million bushels of apples were blown to the ground, and hundreds of homes and buildings suffered minor damage and scores of others heavier or structural damage. South and east of Williamsport over 600,000 users of electric power were without service, some for 4 days, and over 70,000 telephone subscribers were without service for varying periods. In the Philadelphia area the Philadelphia Electric Company reported 300,000 customers without service for periods ranging up to 5 days, and that repair costs were expected to exceed $1,500,000. Total wind damage in the Philadelphia area was estimated at $2,300,000. Additional wind damage in east-central counties, including the Allentown area, was $2,000,000, and another $1,000,000 occurred in the remainder of the State, thus giving an overall state total of $5,300,000. The western part of Pennsylvania suffered from floods as a result of heavy rains, and losses as reported by the American Red Cross were 13 persons killed, 29 injured, 262 houses with major damage, 2,117 with minor damage, and 212 other buildings destroyed. Newspaper reports indicated losses might be anywhere from $10,000,000 to $15,000,000. Thus, total damage for the State may range from $15,000,000 to $20,000,000.

NEW JERSEY.--There were 5 deaths in New Jersey. The Public Service Electric and Gas Co., estimated cost of restoring service at $1,300,000. Other forms of damage were estimated as follows: Homes and buildings, $4,000,000; shade trees and fruit trees, $1,000,000; New Jersey Bell Telephone Co. $1,000,000; apples blown from trees $2,500,000; miscellaneous $200,000. Total damage for the State was $10,000,000. Loss of life and damage in New Jersey was much less by Hazel than by the November 25, 1950 storm.

NEW YORK STATE.--Twenty-one deaths were attributed to Hazel in this State, and damage ran into the millions. While strong winds covered the entire State, the central portions took the brunt of the storm. For the State as a whole 70,000 telephones were out, 52,000 of them in the general area of the Finger Lakes, for a period of 48 hours in most cases, and the total repair cost was estimated at $1,000,000. Wind damage in Syracuse and Onondago County was estimated at $1,000,000, the greatest part being due to disrupted power and communication lines. In Onondago, Oswego, Courtland, and Madison Counties power failures totaled 50,000. Radio and television stations were without power much of the time, and many gasoline pumps were out of operation. Hundreds of boats and docks in Oneida Lake were badly damaged. Lack of power also endangered food supplies in deep freezers. A 491-foot television tower south of Elmira was blown down. Heavy rains in the extreme west flooded basements and washed out several bridges.

NEW ENGLAND.--One death and only $35,000 damage was reported in this section.

METEOROLOGICAL RECORDS AND EXTREMES

Pressure: Unusually low pressures were recorded in the Carolina coastal areas on the 15th. Myrtle Beach reported the lowest pressure on land, 28.47 inches (m.s.l.) at 9:25 a.m. A much lower pressure of 27.70 inches (m.s.l.) was reported by the fishing boat "Judy Ninda" at Tilgham Point while in the "eye" of the storm at 10:30 a.m. New low pressure records were recorded at Wilmington, N. C., 28.68 inches (m.s.l.), and Richmond, Va., 28.75 inches (m.s.l.).

Wind: Peak gusts of 90 m.p.h. or over were reached near and east of the center of the storm from the Carolinas through New York state. Winds were extremely high near the "eye" of the storm along the Carolina beaches and estimates ran as high as 150 m.p.h., but measured speeds ranged up to 106 m.p.h. at Myrtle Beach, S. C. Wilmington, N. C., reported a top gust of 98 m.p.h., fastest mile of 72 m.p.h., and a maximum 5-minute speed of 61 m.p.h., all from the southeast. Norfolk, Va., reported the fastest mile of wind on record there for a hurricane (78 m.p.h. from the south at 4:07 p.m. and 4:30 p.m.) and Richmond, Va., a new record for the fastest mile (68 m.p.h.).

The fastest mile of wind at Syracuse, N. Y., (63 m.p.h.) was a new record there for October, and the city office of the Weather Bureau in New York City recorded a fastest mile of 113 m.p.h. from the southeast at 7:49 p.m., a new all-time record. In Binghamton, N. Y., new records were a 72-m.p.h. wind for a period of 5 minutes and for the fastest mile, and a peak gust of 94 m.p.h. at 8:54 p.m. and 9:46 p.m.

Rainfall: Pittsburgh had a new October rainfall record for 24-hours of 3.56 inches and an all-time record 12-hour amount of 3.41 inches on the 15th. Winston-Salem, N. C., had a record 6.24-inch amount in 24 hours on the 15th. Greatest rainfall totals for the storm, over 9 inches, were recorded in the Carolinas and Virginia. The greatest total in South Carolina was 9.19 inches at Myrtle Beach and in North Carolina, 9.72 inches at Carthage. A special rain gage kept by the U. S. Geological Survey at Robbins, several miles north of Carthage, N. C., measured 11.25 inches. In Virginia 10.71 inches were measured at Big Meadows and 10.60 inches at Natural Bridge.

WARNINGS

Advisories on the expected path, severity, and position of this storm were highly accurate and timely. The public and emergency agencies were informed of Hazel by the most efficient radio, television, newspaper, telephone, and messenger coverage ever accorded a hurricane. This was very important in the Carolina Beach areas where the timely warnings enabled residents to evacuate the beaches before the storm's arrival, thus preventing a high death toll. Some radio stations in the Carolinas remained on the air throughout the night of the 14th, broadcasting hurricane advisories and other related news. These advisories were almost continuous during the approach and passage of the storm. Utilities, transportation companies, and other segments of business, commerce, and industry, forewarned, were able to take the necessary precautions and to make plans for repair work which enabled them to restore service much earlier than would otherwise have been possible.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

OCTOBER 1954

The most significant flooding during October resulted from the heavy rain accompanying Hurricane Hazel as it moved in a northerly direction from Myrtle Beach, S. C., through central North Carolina, east-central Virginia, central Maryland, central Pennsylvania, and western New York. Several million dollars' worth of damage resulted from this flooding.

Two other disastrous floods with damages amounting to several millions of dollars occurred in the Chicago, Ill., and Roswell, N. Mex., areas.

ST LAWRENCE DRAINAGE.--Heavy rains (2 to 4 inches) on the 3d caused local flooding on some of the smaller tributaries of the Lower Grand River. Basements and streets were flooded in many sections of Grand Rapids, Mich., and several viaducts were closed to traffic until the water receded. There was considerable erosion damage to farmlands and secondary roads.

Minor flooding occurred in the St. Joseph, St. Mary's, and Maumee Rivers in the Lake Erie drainage between the 11th and the 18th. No material damage was reported.

The Chicago River, which flows through the heart of Chicago, reached its highest recorded level (5.2 feet) on October 10. This is 1.5 feet higher than the previous record. The river, until about 50 years ago, flowed into Lake Michigan. With the construction of the Sanitary and Ship Canal from Chicago to Lockport, the direction of flow was reversed, and water from Lake Michigan now flows through the canal and into the Mississippi River system. The level of the river is now normally about 3 feet lower than that of Lake Michigan; but as a result of the excessive rains on October 9-11, the river rose 3 feet higher than the level of the lake. For the first time since the construction of the locks at the mouth of the river, it was necessary to open the locks and allow the river to again empty into the lake. This was done to avoid even greater flood damage to the loop skyscrapers. The locks were open for 5 hours, and then closed in order to prevent contamination of the city's water supply, which is obtained from Lake Michigan. Total damage from the flood was estimated at $10 million in Chicago, and $15 million in suburban areas where hundreds of homes, mostly on the south side, were flooded to depths of several feet or more. Several persons in low-lying areas were forced to leave their homes. A detailed report of this flood, including an isohyetal map, is given in Weekly Weather and Crop Bulletin, Volume XLI No. 46, for the week ending November 8, 1954. An analysis of the meteorology of the storm may be found in the October issue of Monthly Weather Review.

ATLANTIC SLOPE DRAINAGE.--Slight flooding occurred on the 16th in the headwaters of the Juniata River basin (Frankstown Branch) as a result of the rains associated with the northward passage of Hurricane Hazel. The precipitation averaged 4 inches over the Frankstown Branch and 4-3/4 inches over the Raystown Branch during the 12-hour period between 8:00 a.m. and 8:00 p.m. on the 15th. In the Juniata River basin, the precipitation averaged over 3 inches and in the West Branch Susquehanna about 2-1/4 inches. Only moderate to slight rises were experienced in the lower main stem of the Susquehanna River. No damage was reported.

At about 10:00 p.m. on the 15th, the Potomac River reached a stage of 8.9 feet, 1.9 feet above flood stage, at the Wisconsin Avenue gage in Washington, D. C. This high stage was due to the strong southeasterly winds resulting from the passage of Hurricane Hazel a few miles west of Washington at 4:53 p.m. The average wind velocity at 4:50 p.m. was 66 m.p.h. from the southeast. The fastest mile recorded was 78 m.p.h. from the southeast at 4:51 p.m. and the strongest gust was 98 m.p.h. from the southeast at 5:08 p.m. The stage of 8.9 feet was the highest stage reached in the Washington tidewater area since the record flood of October 1942. It was also the highest tide reached in Washington from wind effects rather than surface runoff since the hurricane of August 1933, when a stage of 11.1 feet occurred. As the tropical storm moved northward over North Carolina, Virginia, and Maryland, heavy rains occurred over the Potomac and Rappahannock River basins. The rain averaged about 5 inches and ranged from 1.25 inches at Fredericksburg to 10.71 inches at Big Meadows, Va. The highest stage since October 1942 occurred in the North Branch of the Potomac at Cumberland, Md., on the 16th. The stage of 18.9 feet on the South Branch at Springfield, W. Va., was the highest stage since June 1949. Flooding elsewhere over the Potomac was comparatively minor.

Only slight flooding occurred over a short reach in the James River in Virginia in connection with the rains attending the northward passage of Hurricane Hazel on the 15th. There were two centers of heavy rains, one around Natural Bridge Station (10.6 inches) and the other immediately north of the James Basin, referred to above as Big Meadows, Va. No damage was reported from the light overflows.

The flooding in eastern North Carolina between the 15th and 21st was due to the heavy rains accompanying Hurricane Hazel as it moved rapidly northward across the eastern Piedmont section on the 15th. The precipitation averaged 6 inches along the upper reaches of the Dan and Roanoke basins; 7 inches along the upper reach of the Cape Fear basin, and an average of 5 inches over the remainder of the basin; 4 inches along the upper two-thirds of the Neuse basin, and about 1.75 inches along the remainder; and 1.5 inches along the Tar basin. The damage due to flooding was small.

The drought in South Carolina, while alleviated in some areas by the heavy rains accompanying Hurricane Hazel on the 14th and 15th, is still reflected in most streams by below-normal stages. The only stream to reach near-bankfull stage in South Carolina was the Pee Dee River at Cheraw and Peedee, S. C.

The record drought in Georgia continued unabated through October. The rainfall in the Altamaha River basin averaged 0.53 inch for the entire month. At Abbeville, Ga., on the Ocmulgee River, the previous low record of -1.7 feet was equaled or exceeded every day of the month, and a new low of -2.25 feet was established from the 24th to the 31st. At Hawkinsville, Ga., a new low of 0.33 feet occurred several times during the month. The previous low was 0.4 foot. At Lumber City, Ga., the former record of -0.9 foot was equaled several times, the lowest reading being -0.94 foot on the 24th and 30th.

EAST GULF OF MEXICO DRAINAGE.--During October, new record-low stages were established on the Apalachicola River at Chattahoochee and Blountstown, Fla. At Chattahoochee the new record-low stage of -2.2 feet was established on the 13th and exceeded the previous record-low stage of -1.5 feet of September 24, 1925, by 0.7 foot. The new record-low stage of 1.7 feet at Blountstown exceeded the previous record-low stage of 2.6 feet of September 23, 1925, by 0.9 foot.

The stage of 0.80 foot at Marion Junction, Ala., on the Cahaba River during the period of the 19th-22d equaled the record-low stage of 0.80 foot reached on September 15-16, 1954.

The Pascagoula and Pearl Rivers reached near record-low stages at several points during the month. The flow of the Pearl River at Jackson, Miss., reached an alltime low, although apparent silting of the bed of the channel prevented a record-low stage.

Upper Mississippi Basin.--The heavy rains (4.22 inches at Blair, Wis.) resulted in flash-flood conditions over most of the Trempealeau River Valley on the 4th. A stage of 8.7 feet was reached at Dodge, Wis., near the mouth of the river. Some damage resulted to roads and bridges. Several basements in the area were flooded causing damage to furnaces and water heaters.

The flooding on the Illinois River between the 10th and 21st was due to heavy rain (4.25 inches) over the basin during the 48-hour period ending on the morning of the 11th. A sharp rise began in the Mississippi River on the 11th and near-bankful stages resulted at Clarksville (Dam 24) and Winfield (Dam 25), Ill.

Missouri Basin.--The record-low stage of 1.5 feet on the upper Kansas River on July 29-31, 1954, at Fort Riley, Kans., was equaled on the 1st-3d.

Ohio Basin.--The severe flooding between the 15th and 18th in the upper Ohio basin was due to heavy rainfall (3.5 to 4.5 inches) that occurred during the 12-hour period between 8:00 a.m. and 8:00 p.m. on the 15th as Hurricane Hazel moved northward. Small creeks in the Pittsburgh watershed turned into raging torrents, swelling the main rivers that flow through the city. The Ohio River reached a stage of 32.4 feet at Pittsburgh on the 16th, 7.4 feet above flood stage and 1.0 foot below the 33.4-foot stage reached in 1945. This flood did far more damage than the 1945 flood. At least 13 persons are known to have lost their lives in western Pennsylvania. In Pittsburgh, water was reported in cellars of some downtown business establishments, necessitating use of pumps. The B&O railroad yard on the north side was inundated by about 10 feet of water, and the dwellings and business establishments along the river bank were flooded. Hundreds of persons along the Monongahela and Youghiogheny Rivers were left homeless due to the high water. The flood on the Youghiogheny at West Newton, Pa., was the worst in the town's history, with water covering the business district to a depth of 5 feet, 2 feet more than in the 1936 flood. As the flood moved down the Ohio River from Pittsburgh, flood stages were exceeded by 6 to 10 feet at all communities as far down river as Dam 13, McMechen, W. Va. Flood damages are expected to range between 10 and 15 million dollars.

According to the U. S. Geological Survey, the October mean monthly flow of the French Broad River at Asheville, N. C., was the lowest mean October flow of record, which started in 1897. Previous record was October 1904.

Arkansas Basin.--The Arkansas River reached a new low-water stage of -0.46 foot at Wichita, Kans., on the 15th and 19th. At Tulsa, Okla., the mean monthly stage of 2.4 feet was 2.5 feet below normal. This was the lowest mean monthly October stage of record. The previous October lows were 2.8 feet in 1953 and 2.9 feet in 1939, 1947, and 1952. At Van Buren, Ark., the Arkansas River had a mean monthly stage of 2.2 feet, or 4.9 feet below normal. This was the lowest of record. The previous low was 2.3 feet in 1939. The lowest stage of record that had been established last month was equaled on the 11th by a reading of 0.4 foot. The Cimarron River at Perkins, Okla., had a mean monthly stage of 2.5 feet, which is 1.8 feet below normal. This was also a record-low mean monthly stage for October. The previous low was 2.6 feet in 1952.

Red Basin.--The light flooding in the Sulphur River towards the end of the month was due to heavy showers and thundershowers on the 21st-22d. Several stations reported precipitation amounts over 3 inches. The extremely dry ground due to the prolonged drought evidently was the factor that prevented serious flooding. Little or no damage resulted from the flooding.

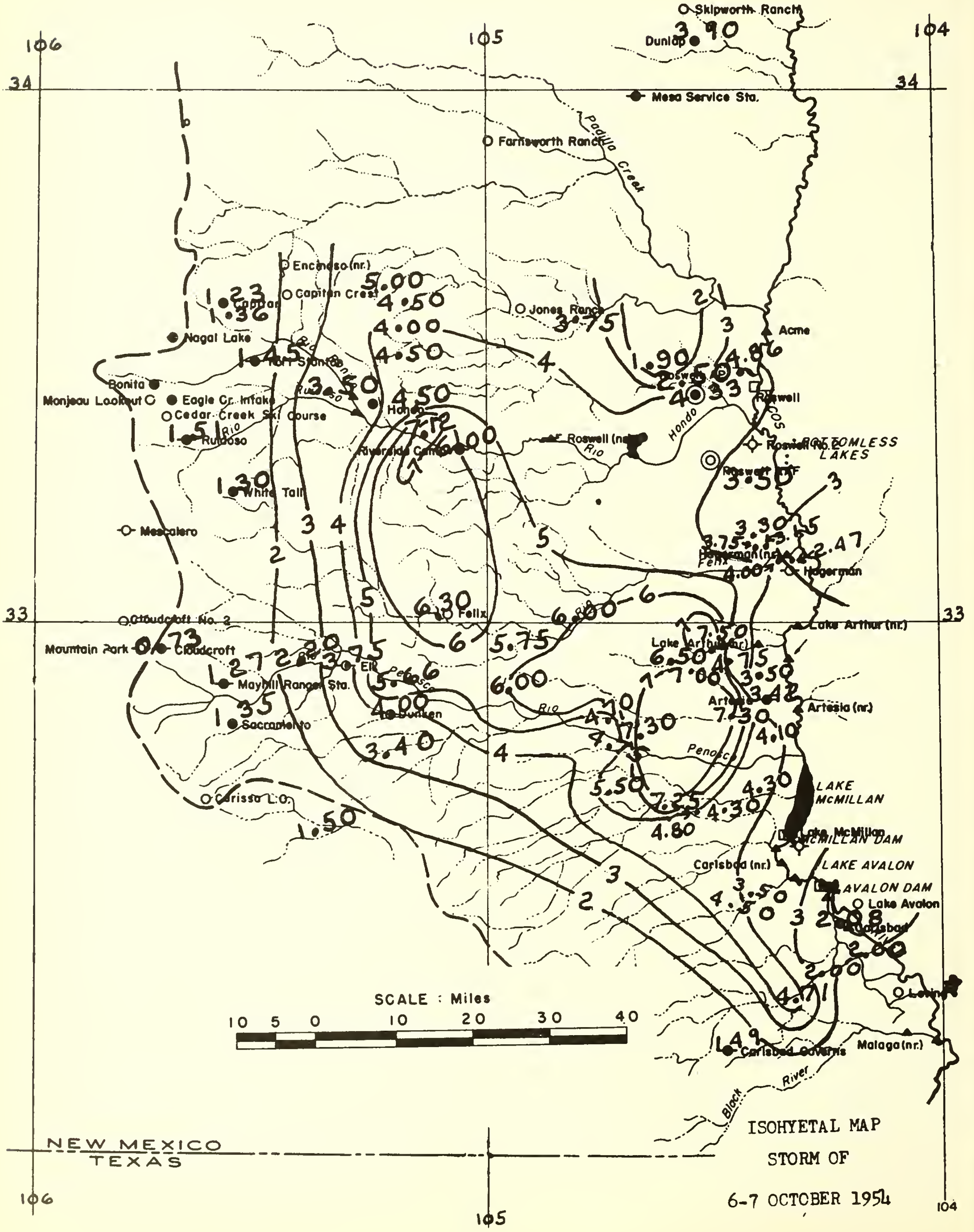
WEST GULF OF MEXICO DRAINAGE.--The month began with all streams low. Total precipitation for the month was near to slightly above normal. It occurred mostly during the second week on Louisiana streams and during the fourth week on the Sabine. The Nespique approached bankfull at Basile, La., on the 17th. The Sabine flooded slightly at Mineola, Tex., on October 27-November 2 and crested just below flood stage at Gladewater, Tex., on November 5.

Heavy damages resulted from the flooding in the Roswell, N. Mex., area from October 6-9. Flooding resulted primarily from overflow of normally dry arroyos. The Rio Felix flood was apparently the greatest for that stream in 70 years or more, and Rocky Arroyo near Carlsbad, Seven Rivers, and Eagle Creek, were the highest since 1916. Data available at this time indicate some 12,000 acres inundated, more than 300 buildings damaged or destroyed, 8 persons dead, and considerable damage to roads, bridges, railroads, and municipal property. Conservative estimates place the damage between $2 and $3 million. This flood was due to heavy precipitation in mountain and foothill areas to the west of Roswell during the 6th and 7th. An isohyetal map shows the distribution and location of the heavy rain centers.

Great Basin.--Flash floods occurred in southern Utah around Glendale and Orderville in Kane, Springdale, and Washington Counties on the 8th due to heavy rain caused by thunderstorm activity. Orderville reported 2.1 inches of precipitation in one hour and forty-five minutes. Zion National Park near Springdale reported 0.8 inch in less than one hour. Considerable damage resulted to alfalfa crops, feed pastures, small bridges, roads and highways, residential basements, and to the Orderville culinary water supply system.

FLOODS IN PUERTO RICO.--A report of the severe floods in Puerto Rico on October 12-15, 1954, resulting from the passage of Hurricane Hazel, is being published in the October issue of Monthly Weather Review.

October 1954



ISOHYETAL MAP
STORM OF
6-7 OCTOBER 1954

FLOOD STAGE DATA

(All dates in October unless otherwise specified)

Table 5

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
	Ft.			Ft.	
ST. LAWRENCE DRAINAGE					
St. Marys: Decatur, Ind.	13	16	16	13.25	16
St. Joseph: Montpelier, Ohio	10	11 15	11 18	10.2 11.0	11 16
Maumee: Fort Wayne, Ind.	15	14	17	16.5	15
ATLANTIC SLOPE DRAINAGE					
Frankstown Branch Juniata: Williamsburg, Pa.	12	16	16	12.4	16
North Branch: Cumberland, Md.	17	15	16	24.0	16
South Branch: Springfield, W.Va.	15	15	16	18.9	16
North Fork: Cootes Store, Va.	15	15	15	15.2	15
Potomac:					
Williamsport, Md.	23	16	17	23.7	17
Harpers Ferry, W. Va.	18	17	17	**18.5	17
Washington (near), D. C.	10	17	18	13.3	17
Washington, D. C.	7	15	15	8.9	15
James:					
Bremo Bluff, Va.	19	16	17	20.3	16
Columbia, Va.	18	16	17	20.0	16
State Farm, Va.	12	17	17	13.5	17
Dan: Danville, Va.	11	15	17	**14.3	16
Roanoke:					
Altavista, Va.	18	15	16	**31.2	16
Randolph, Va.	21	15	18	**25.2	17
Cape Fear:					
Moncure, N. C.	20	15	17	**23.0	16
Fayetteville, N. C.	35	16	19	**42.0	18
Lock No. 2, Elizabethtown, N. C.	20	16	21	30.5	19
MISSISSIPPI SYSTEM Upper Mississippi Basin					
Trempealeau: Dodge, Wis.	7	4	6	8.7	4
Illinois:					
Morris, Ill.	13	10	13	**18.6	12
La Salle, Ill.	20	11	16	27.4	12
Chillicothe, Ill.	45	14	20	**46.9	15
Havana, Ill.	14	17	21	15.0	18
Ohio Basin					
French Creek: Meadville, Pa.	57	15	18	58.6 59.2	16 16
Allegheny:					
Lock 5, Freeport, Pa.	21	16	17	22.6	16
Lock 4, Natrona, Pa.	20	16	16	20.5	16
Lock 3, Acmetonia, Pa.	20	16	16	20.5	16
Tygart:					
Dailey, W. Va.	9	--	--	13.5	--
Elkins, W. Va.	17	16	16	18.8	16
West Fork:					
Weston, W. Va.	17	15	16	20.0	16
Clarksburg, W. Va.	7	16	16	7.6	16
Cheat: Parsons, W. Va.	11	15	16	19.1	15
Youghiogheny:					
Confluence, Pa.	12	15	16	20.0	15
Connellsville, Pa.	16	15	16	20.0	16
Sutersville, Pa.	20	16	16	#32.0	--
Monongahela:					
Lock 8, Pt. Marion, Pa.	21	16	16	21.3	16
Lock 7, Greensboro, Pa.	23	16	16	29.1	16
Lock 6, Rices Landing, Pa.	25	16	16	26.9	16
Lock 5, Brownsville, Pa.	23	16	17	30.9	16
Lock 4, Charleroi, Pa.	24	16	17	32.4	16
Lock 3, Elizabeth, Pa.	23	16	17	31.5	16
Lock 2, Braddock, Pa.	26	16	17	35.2	16
McKeesport, Pa.	12	16	17	22.7	16
MISSISSIPPI SYSTEM (Cont'd.) Ohio Basin (Cont'd.)					
Little Kanawha:					
Glenville, W. Va.	23	15	16	28.2	16
Creston, W. Va.	20	16	17	21.1	16
Elk: Sutton, W. Va.	25	16	16	#30.0	16
Ohio:					
Pittsburgh, Pa.	25	16	17	32.4	16
Dashields Dam, Pa.	26	16	17	32.8	16
Montgomery Dam, Pa.	32	16	17	41.9	17
Dam 7, Midland, Pa.	30	16	18	44.1	17
Dam 8, Newell, W. Va.	32	16	18	42.5	17
Dam 9, N. Cumberland, W. Va.	34	16	18	41.7	17
Dam 10, Steubenville, Ohio	33	16	18	42.8	17
Dam 11, Wellsburg, W. Va.	32	16	18	42.8	17
Dam 12, Wheeling, W. Va.	36	16	18	44.7	17
Dam 13, McMechen, W. Va.	37	16	18	47.1	17
Dam 15, Duffy, Ohio	42	17	18	42.5	17
Marietta, Lock 1, Ohio	35	17	18	37.8	18
Parkersburg, W. Va.	36	18	19	37.2	18
Red Basin					
Sulphur: Naples, Texas	22	29	Cont'd.	24.76	31
WEST GULF OF MEXICO DRAINAGE					
Sabine: Mineola, Texas	14	26	Nov. 2	16.74	30

* Provisional
** Highest stage reported but not necessarily the crest
# Estimated

FLOOD OF JUNE 1954, IOWA AND ADJACENT STATES

PREFACE.--During the period June 17-21 a belt of heavy rainfall occurred over an area of approximately 50,000 square miles in eastern Nebraska, Iowa, southern Minnesota and western Wisconsin. The approximate axis of the storm was along an arc line from Norfolk, Nebr., through Mason City, Iowa, and Rochester, Minn., to Eau Claire, Wis. The resulting flood reached a climax in the Des Moines area on June 24 where a crest stage of 30.16 feet was experienced. Relatively more severe flooding had been experienced the previous afternoon in the Boone, Iowa, reach of the Des Moines River. All-time records were broken at both points. The crest of 25.34 feet at Boone was about 5.5 feet higher than the previous record of 19.85 on June 24, 1947, while the Des Moines crest was 3.7 feet higher than that of June 26, 1947, and 2.9 feet higher than the previous record of 27.3 feet, May 31, 1903. Total flood damage has been estimated as $28 million and four lives were lost.

The Corps of Engineers, Department of the Army, and the Geological Survey, Department of Interior, have materially aided through the contribution or verification of basic information. The Iowa Natural Resources Council furnished supplemental precipitation data. The Corps of Engineers assisted with the collection of supplemental precipitation data and furnished damage statistics. The Geological Survey furnished river stage data for some points and assisted with the correlation of peak values at other points. The hundreds of cooperating weather and river observers performed an invaluable service in making available the precipitation and river stage information used in this report.

SYNOPTIC BACKGROUND.--The heavy rains of June 17-21, 1954, had their source in tropical maritime air from over the Gulf of Mexico. During the entire period, and for several days prior, high pressure over the southeastern United States in the layer below the 700-mb level favored the flow of this warm, moist, convectively unstable Gulf air up the Mississippi Valley and into the flood area. A cold front extending southward from a low-pressure center moving eastward along the Canadian Border started shower and thunderstorm activity in the area on the 15th and 16th. A second cold front, associated with another low-pressure center in Canada and moving rapidly from the west, reached the area on the 17th. While the low center and the northern portion of the front continued to move rapidly eastward, most of the front lying south of the Border was blocked from further eastward movement by the high pressure over the eastern United States. As a result, the front became quasi-stationary in a northeast-southwest direction from Lake Michigan to Colorado until late on the 21st, when weakening high pressure in the east allowed the front to resume its eastward movement. Wave action along the front while it was lying quasi-stationary across the flood area during June 17-21, caused the heavy showers and thundershowers responsible for the flood.

PRECIPITATION.--Detailed precipitation data, including supplemental reports from unofficial gages, have been published in the June 1954 Monthly Climatological Data. Hourly precipitation values from automatic recording gages are in the process of publication and will appear in the routine supplement to Monthly Climatological Data. All of the above data have been used to prepare isohyetal maps, Figures 2-4 of this report. Due to variable times of observation it is not possible to precisely correlate all amounts for individual maps. Subject to this limitation the map represents approximate total precipitation for midnight to midnight of the periods indicated. Actual distribution of rainfall is more accurately shown by Table 1, Mass Rainfall Curves. This shows graphically the distribution as recorded at 24 key points in the storm area. With a few rather important exceptions, the bulk of the devastating precipitation occurred in two principal periods, (1) About midnight of June 17-18, and, (2) Late evening of June 20. A notable exception being approximately 5.0 inches at Dawson in southeastern Nebraska in a 6-hour period from midnight to 6 a.m., June 17. The greatest storm total was observed at the Mason City, Iowa, airport where 13.11 inches fell in the 7-day period, June 15-21. Depth-area values for the 7-day period have been computed as follows:

Area in square miles	Rainfall in inches
10	13.1
100	12.9
500	12.2
1,000	11.5
5,000	9.2
10,000	8.2
50,000	5.9

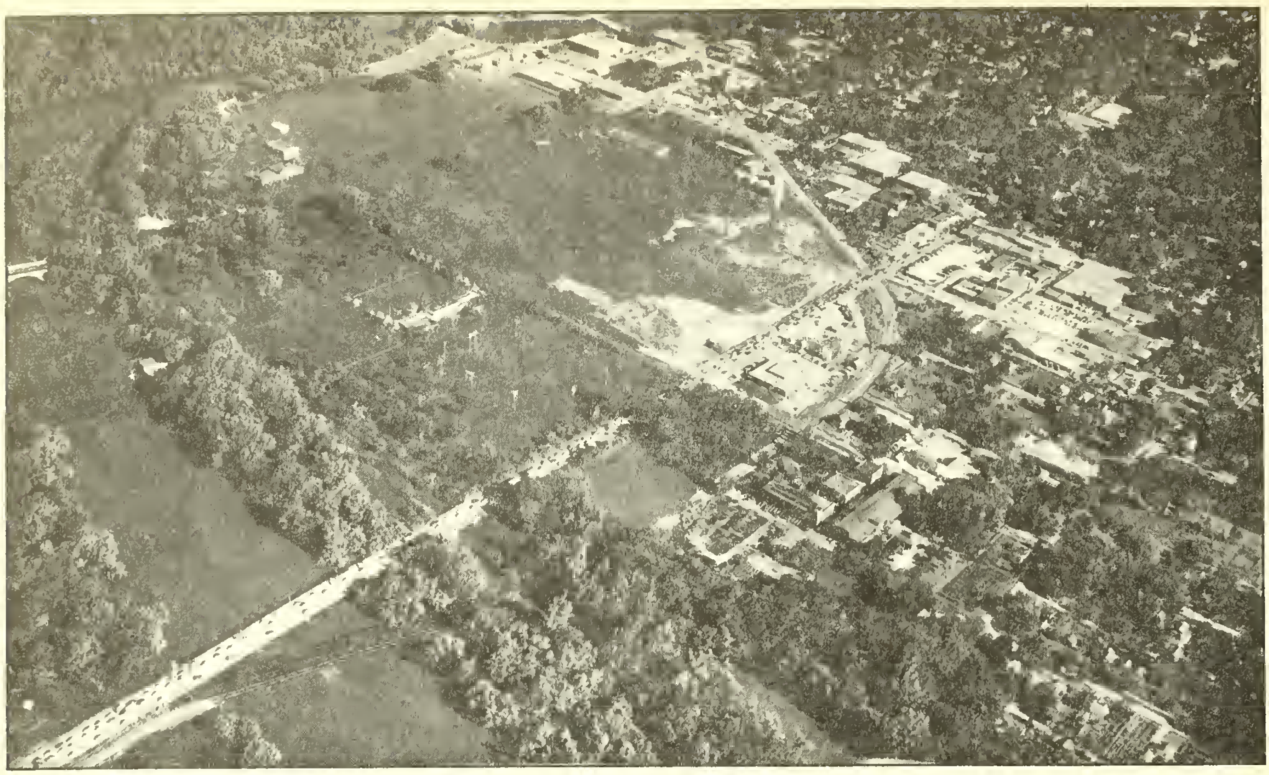
FLOODS.--Table 1 contains river-stage data for the period of flooding. Record stages were broken on most of the main stem reaches of the Des Moines River above Des Moines, Iowa, and at most points on the lower Little Sioux and tributaries. The crest on the Nemaha River at Falls City, Nebr., was less than 1 foot below the record of 1949. Upper reaches of the Big Sioux were not seriously affected, although runoff in the lower reaches from tributaries such as the Rock River was sufficient to produce a record stage of 19.95 feet at Akron, Iowa. In general the flooding was confined to tributaries. Neither the Mississippi or Missouri main stems were materially affected. A graphical presentation, Figure 5, illustrates the duration of flooding, time of crest, travel, and relative magnitude of the flood. (Special attention is called to Table 1. These data supersede provisional data shown on Page 218, National Climatological Summary of June 1954.)

DAMAGE.--Table 2, showing estimated flood losses has been compiled from all available sources, and so far as practical, coordinated with Federal and State agencies. Since the flood occurred during the latter half of June, agricultural losses were very high. Losses to growing crops have been estimated as $18 million or 64 percent of the total flood loss. Over 567,000 acres in the very heart of the Corn Belt were flooded. Although this flood was confined to tributaries, the total loss of approximately $28 million places it seventh in monetary losses of all upper Mississippi and Missouri floods. In the Des Moines Basin, including the Boone and Raccoon Basins, the total loss of $13 million was the second greatest of record, being exceeded only by that of 1947 when a monetary loss of $26 million and a life loss of 25 was experienced.

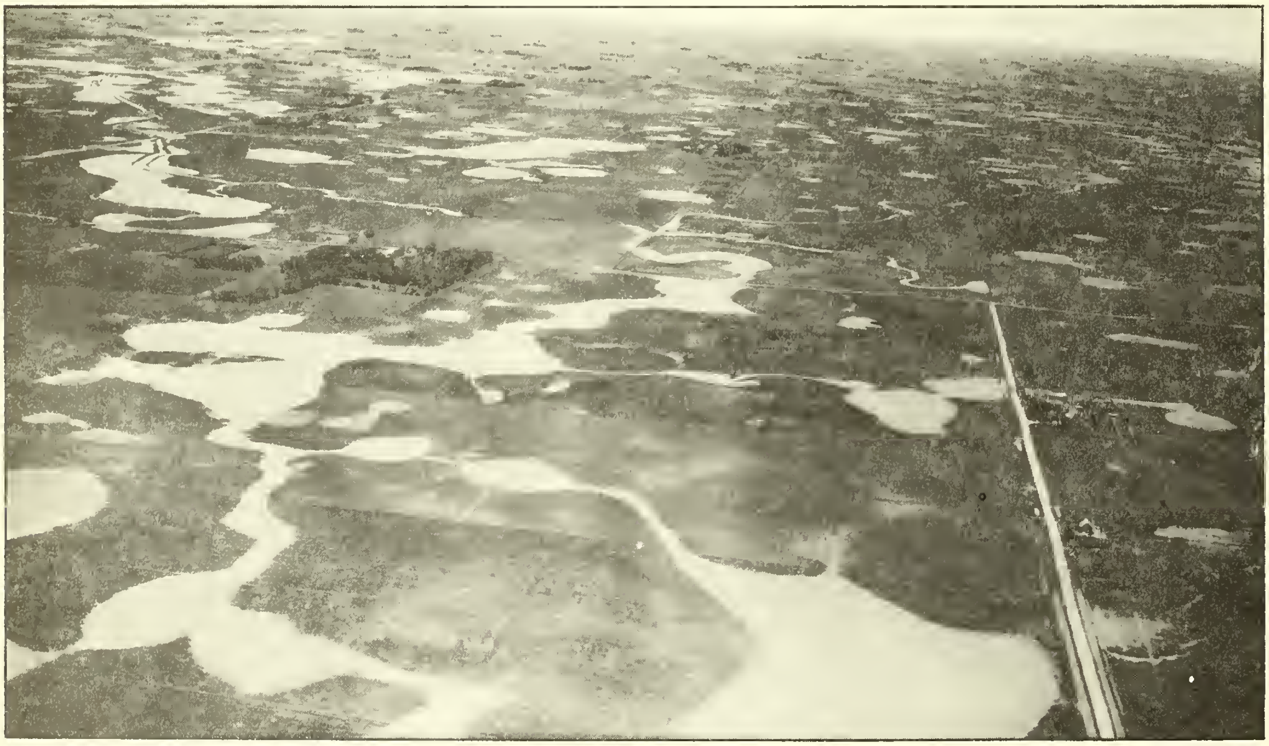
EFFECTS OF PROTECTIVE MEASURES.--Approximately

$1.4 million dollars were spent in flood fighting, emergency protection, evacuation, and reoccupation. Of this amount approximately $1 million was spent for actual emergency protection and evacuation. This effort resulted in an estimated saving of over $18 million or a cost-to-benefit ratio of 1:18. It is interesting to note that only four lives were lost. Losses to movable property were only about $45,000. A flash-flood warning service established to serve the Floyd and Little Sioux Basins proved very effective. No lives were lost in this area and no losses to movable property were reported.

The effectiveness of timely and accurate river stage forecasts and warnings in the Des Moines Basin was clearly demonstrated. Illustrative of this service is the metropolitan area of Des Moines, Iowa. At 8:00 a.m., June 21, prior to the end of the storm, a crest of near 26.5 feet was predicted. This was equivalent to the crest of the serious 1947 flood and served to alert the entire area. At 10:00 a.m., June 22, after all rainfall had been reported, a forecast of an expected crest of 30.0 feet was released. The entire area responded to this warning and a well organized flood fight was started 48 hours before the crest of 30.16 feet was reached. The saving in the Des Moines area alone was over $12 million. The cost of emergency protection, evacuation, and reoccupation was less than three-quarters of a million, or a cost-to-benefit ratio of about 1:16.



A. Des Moines River at Des Moines, Iowa; crest 30.16 feet, June 24, 1954. Second Avenue Bridge in lower foreground and flooded Sixth Avenue in left central portion. (Courtesy Des Moines Register & Tribune.)



B. Near Woden, Iowa, on divide between headwaters of Iowa and East Fork Des Moines Rivers, illustrating extent of temporary storage, a condition common to much of Des Moines Basin. (Courtesy Des Moines Register & Tribune.)

Table 1 - River Stage Data, June 1954 Flood

	CHIPPEWA RIVER Durand, Wisc.	TREMPEAUEAU RIVER Dodge, Wisc.	ROOT RIVER Houston, Minn. (Below So. Fork)	CEDAR RIVER Charles City, Ia.	CEDAR RIVER Waterloo, Ia.	CEDAR RIVER Cedar Rapids, Ia.
Zero of gage,msl,ft.	695.20 (12 adj.)	663.78 (12 adj.)	660.00 (12 adj.)		824.09 (29 adj.)	700.33 (29 adj.)
Drainage area, sq.mi.	9,010	633	1,560	1,080	5,190	6,573
Flood stage, feet	11	-	15	9	15	13
Previous record stage	15.45, 9-2-1941(a)	11.5, 3-17-1919	18.05, 9-10-1938	18.9, 4-8-1951	18.8, 4-9-1951	20.1, 3-19-1929
Period of record	1928-54	1913-19, 34-54	1938-54	1945-54	1941-54	1903-54
June 15	4.6	0.7	6.0	2.4	5.6	4.0
16	4.1	0.5	6.0	3.0	5.8	3.9
17	4.5	1.1	6.7	3.9	6.0	3.8
18	3.9	0.7	6.2	5.4	6.7	3.8
19	8.3	3.6	-	9.3	7.5	4.2
20	11.2	6.3	11.5	15.3	9.2	4.6
21	11.9(1)	7.8(1)	12.5(1)	16.1	12.6	5.2
22	11.4	7.7	10.6	13.7	13.4	5.9
23	9.5	6.4	10.4	9.0	17.8(1)	6.7
24	7.5	4.9	8.9	6.6	17.2	8.3
25	6.5	2.9	8.0	5.4	13.7	11.8
26	6.3	2.3	7.7	3.9	10.4	14.0(1)
27	6.2	1.9	7.6	3.8	9.0	12.2
28	8.8	1.8	7.4	3.6	8.1	9.6
29	8.0	1.5	7.1	3.5	7.7	7.5
30	6.8	1.5	8.3	3.5	7.3	6.6
Crest Stage	(1) 11.95, 3:00P (a) Historical crest 18.4, Sept. 12, 1884	(1) 7.75, 7:00A	(1) 12.72, 3:00A		(1) 18.40, 3:00P	(1) 14.00, 9:00A

	IOWA RIVER Marshalltown, Ia.	IOWA RIVER Wapello, Ia.	DES MOINES RIVER Boone, Ia.	DES MOINES RIVER Des Moines, Ia. (2nd Ave.)	RACCOON RIVER Jefferson, Ia.	RACCOON RIVER Van Meter, Ia.
Zero of gage,msl,ft.	853.10 (29 adj.)	548.98 (12 adj.)	871.52 (12 adj.)	773.84 (29 adj.)	956.77	841.15 (29 adj.)
Drainage area, sq.mi.	1,530	12,387	5,490	6,180	1,630	3,408
Flood stage, feet	13	10	12	23	10	13
Previous record stage	17.7, 6-4-1918	16.85, 6-17-1947	19.85, 6-24-1947	26.5, 6-26-1947(a)	22.3, 6-23-1947	21.6, 6-13-1947
Period of record	1913-27, 33-54	1915-54	1905-54	1897-54	1940-54	1915-54
June 15	9.1	3.4	3.0	16.2	10.0	8.1
16	13.6(1)	4.0	2.5	16.4	8.5	12.1
17	14.9	3.7	2.0	15.8	7.7	7.0
18	11.5	3.7	1.7	15.3	-	6.0
19	9.8	3.2	1.5	14.7	6.8	5.5
20	8.9	3.1	5.4	14.5	6.8	5.1
21	9.3	3.6	14.4	17.7	12.0	5.3
22	13.3	5.4	25.1(1)	19.5	14.0	9.8
23	14.5	5.9	25.2	27.2	19.3(1)	10.6
24	15.2	6.0	22.5	30.2(1)	17.1	12.1
25	15.5(2)	6.5	18.1	29.1	15.5	17.4(1)
26	15.1	6.9	14.2	26.5	14.4	15.6
27	14.3	7.4	11.2	23.6	13.3	13.3
28	13.3	9.1	9.0	21.3	12.1	11.5
29	12.3	11.6	7.4	19.5	10.2	9.9
30	11.6	11.9(1)	6.1	18.1	9.1	7.7
Crest Stage	(1) 16.02, 8:30P (2) 15.51, 1:30A	(1) 12.1, 2:00A	(1) 25.34, 4:00P	(1) 30.16, 9:00A (a) 27.3, 5-31-03 from profile	(1) 19.51, 12:01A	(1) 17.40, 6:00A

	DES MOINES RIVER Tracy, Ia.	DES MOINES RIVER Ottumwa, Ia.	DES MOINES RIVER Keosauqua, Ia.	MISSISSIPPI RIVER St. Paul, Minn.	MISSISSIPPI RIVER Davenport, Ia.	MISSISSIPPI RIVER Gregory Landing, Mo.
Zero of gage,msl,ft.	671.78 (12 adj.)	622.77 (29 adj.)	558.10 (12 adj.)	683.68 (29 adj.)	542.00 (29 adj.)	472.71 (12 adj.)
Drainage area, sq.mi.	12,458	13,328	13,992	36,780	88,449	133,900
Flood stage, feet	14	9	20	14	15	15
Previous record stage	26.5, 6-14-1947	20.2, 6-7-1947	27.85, 6-1-1903	22.1, 4-16-52	20.9, 3-10-1868	21.1, 5-28-1944
Period of record	1920-54	1917-54	1903-06, 10-54	1878-54	1860-54	1930-54
June 15	10.8	6.2	5.9	3.9	7.5	8.0
16	11.6	5.6	5.7	3.9	7.3	8.3
17	14.0	8.2	6.4	3.9	6.9	8.4
18	10.7	7.5	8.0	3.9	6.9	7.8
19	8.6	5.0	5.7	4.3	6.6	8.1
20	7.5	3.9	4.2	5.3	6.5	7.3
21	7.0	3.3	3.4	5.3	6.5	6.8
22	12.2	5.9	2.9	5.2	7.2	7.1
23	12.4	6.9	6.6	5.4	9.0	7.6
24	14.7	8.3	7.0	5.7	9.7	9.2
25	16.5	9.5	8.5	5.9	9.8	10.3
26	21.1	10.7	9.4	6.0	9.6	11.0
27	22.1(1)	13.5	11.3	6.1(1)	9.7	11.7
28	21.2	16.7(1)	14.0	6.0	10.1	12.1
29	19.7	16.7	16.0(1)	5.6	10.3	12.8
30	18.0	15.2	16.0	5.4	10.7	14.1
					(1)	(1)
Crest Stage	(1) 22.14, 3:00A	(1) 16.89, 10:00P	(1) 16.20, 2:30P	(1) 6.1, 7:00A	(1) 11.0, July 1	(1) 15.0, July 1

Table 1 - River Stage Data, June 1954 Flood

	ROCK RIVER Rock Valley, Ia.	BIG SIOUX RIVER Akron, Ia.	MISSOURI RIVER Sioux City, Ia.	FLOYD RIVER Sheldon, Ia.(*)	FLOYD RIVER Alton, Ia.(*)	FLOYD RIVER LeMars, Ia.(*)
Zero of gage, msl, ft.	1,216.00	1,118.90	1,076.96	1,371.11	1,279.90	1,180.0
Drainage area, sq.mi.	1,630	8,851	314,617	88(approx)	277(approx)	494(approx)
Flood stage, feet		16	16	12	6	20
Previous record stage	17.0, 1897(a)	19.75, 4-1-52	24.28, 4-14-52	20.0, 6-7-53(a)	- 6-8-53(a)	26.4, 6-8-53(a)
Period of record	1948-54	1928-54	1878-54	1953-54	1953-54	1953-54
June 15	4.8	5.3	3.1			
16	4.8	5.3	3.2			
17	4.8	5.3	3.3			
18	4.9	6.0	3.6		3.5	
19	10.7	14.4	4.1	10.1	5.5	17.0
20	14.3	16.2(2)	6.4	10.9(1)	8.8(1)	19.9
21	15.9(1)	19.0	6.8	8.6	8.0	20.7(1)
22	14.0	19.9(1)	6.1		7.5	19.7(2)
23	11.1	18.5	6.2		6.9	
24	9.1	16.7	5.8		6.6	
25	8.2	11.9	5.3		6.4	
26	7.7		4.7		6.1	
27	7.6	9.4	3.6		5.7	
28	7.2		3.3		5.5	
29	6.8		3.2		5.5	
30	6.4		3.0		5.5	
Crest Stage	(1) 15.85, 6:00A (a) Ia. Highway Commission	(1) 19.95, 4:00A (2) 8:30A Stage		(1) 4:00A Highest Obs. (a) From HWM	(1) 8.8, 5:00A (a) From HWM 21.3 Upstream 18.7 Downstream	(1) 20.8, 3:00A (2) 9:00A Stage (a) From HWM

	W. BR. FLOYD RIVER Maurice, Ia. (*)	FLOYD RIVER Merrill, Ia.(*)	FLOYD RIVER James, Ia.	LITTLE SIOUX RIVER Spencer, Ia.	LITTLE SIOUX RIVER Peterson, Ia.(*)	LITTLE SIOUX RIVER Cherokee, Ia.(*)
Zero of gage,msl,ft.		1,154.38	1,102.59	1,294.56		1,150.00
Drainage area, sq.mi.	128(approx)	841(approx)	918	1,030	1,605(approx)	2,060(approx)
Flood stage, feet	13	12	16	10	16	17
Previous record stage	21.2, 6-8-53(a)	20.0, 9——26(a)	25.7, 6-8-53	20.05, 6-8-53(a)	20.90, 6——53	22.7, 6-11-53(a)
Period of record	1953-54	1943-54	1934-54	1936-42, 53-54	1953-54	1943-54
June 15					6.0	
16					5.5	
17					5.0	
18	12.0	3.2			9.8	11.5
19	11.8	10.2	17.0	12.0	15.5(1)	16.8
20	15.0(1)	12.8	19.4(2)	14.3	17.6	22.0(1)
21	13.2(2)	13.4(1)	19.5	15.6(1)	17.5	20.5
22	10.3(3)	13.7(2)	19.9(1)	16.4	18.6	20.4
23		8.6	18.9	15.0	18.7(2)	20.8
24			15.6	13.6	18.0	20.7
25				12.8	16.8	19.9
26				12.3	15.8	18.8
27				12.5	15.1	17.5
28				11.4	14.5	16.4
29				10.9	13.9	15.8
30					13.3	15.4
Crest Stage	(1) Highest Obs. (2) 5:00A Stage (3) 9:30A Stage (a) From HWM	(1) 13.9, 11:00A (2) 3:00A Stage (a) From HWM	(1) 19.88, 2-5A (2) 9:00A Stage	(1) 16.7, 7:00P (a) From HWM	(1) 18.9, 5:00P (2) 18.7, 1:00A	(1) 22.0, 6-8A (a) Legendary crest 25.7, 1891

	LITTLE SIOUX RIVER Washta, Ia.(*)	LITTLE SIOUX RIVER Correctionville, Ia.	LITTLE SIOUX RIVER Oto, Ia.(*)	LITTLE SIOUX RIVER Kennebec, Ia.	NEMAHA RIVER Falls City, Nebr.	MISSOURI RIVER St. Joseph, Mo.
Zero of gage,msl,ft.	1,117.00	1,096.49	1,058.36	1,027.89	861.24	788.19
Drainage area, sq.mi.		2,450		2,730	1,340	424,340
Flood stage, feet	12	19	22	20	20	17
Previous record stage	18.6, 6-8-53(a)	22.6, 4-7-8-51	25.0, 4——51(a)	25.03, 8-7-45	28.8, 6-2-49	27.2, 4-29-81
Period of record	1953-54	1928-32, 36-54	1953-54	1939-54	1944-54	1873-54
June 15	8.8	9.6	10.0	11.2		10.9
16	8.0	9.0	9.6	9.9		10.3
17	8.0	8.9	8.1	9.3	26.4(1)	10.5
18	8.4	8.6	8.1	9.1	23.5	14.6(1)
19	16.2	19.7	17.0	15.0	13.6	11.5
20	18.8	21.5	21.0	24.0	7.2	10.4
21	19.2(1)	22.9(1)	23.1	25.1(1)		12.6
22	18.0	21.6	25.0(1)	26.3		15.3(2)
23	18.0	21.1	24.0	25.0		15.7
24	18.0	21.3(2)	23.0	24.0		14.5
25	17.8	21.1	23.1	23.8		13.1
26	17.0	20.3	23.0	23.6		12.9
27	16.0	19.4	22.0	22.9		12.5
28	15.6	18.7	20.0	21.8		12.4
29	15.2	18.0	18.1	19.4		12.1
30	14.6	17.1	16.1	18.1		11.8
Crest Stage	(1) Highest Obs. (a) From HWM	(1) 23.36, 1:30A (2) 21.27, 10A-1P	(1) 25.1 Highest Obs. (a) From HWM	(1) 26.63, 7:30P	(1) 27.95, 7:00P	(1) 14.6, 6-9A (2) 16.5, 3:00P

(*) Occasional USWB highwater reporting station. Data not published elsewhere.

Table 2 - Estimated Flood Losses, June 17-22, 1954 Flood

	Urban Property					Rural Property					Other Property					
River and drainage	Residential		Commercial		Public	Crops		Livestock	Other		RR's, Highways, Bridges, etc.	Public Utilities	Miscellaneous	Total Loss	Acres Flooded	Lives Lost
	Fixed	Movable	Fixed	Movable		Growing	Stored		Fixed	Movable						
MISSISSIPPI BASIN																
Chippewa	$ 500	$	$	$	$ 2,000	$ 10,000			$ 1,000	$	$ 1,500	1,000	$ 4,000	$ 20,000	1,000	
Zumbro-Whitewater	500		2,000		5,000	75,000					1,500	1,000	2,000	87,000	1,000	
Trempealeau	500		10,000		250,000	10,000			5,000		4,000	3,500	5,000	288,000	3,000	
Root	1,000				8,000	15,000			2,000		1,500	1,000	1,000	29,500	1,500	
Upper Iowa			5,000		5,000	175,000			20,000	1,000	50,000	50,000	5,000	311,000	2,000	
Turkey	200					261,400			7,900				400	269,900	6,516	2
Wapsipinicon														Not Available		
Pecatonica														Not Available		
Sub-total Upper Mississippi	2,700		17,000		270,000	546,400			35,900	1,000	58,500	56,500	17,400	1,005,400	15,016	2
Iowa-Cedar	165,200		57,300		25,500	6,435,200			759,000		423,200		134,100	7,999,500	184,165	1
Skunk						830,300					82,200		400	912,900	31,500	
Des Moines (main stem)	349,300		166,700		138,900	3,039,800			1,098,900		1,502,200		1,575,700	7,871,500	71,660	1
Des Moines (misc. tribs.)						1,935,200			186,600		137,900		500	2,260,200	41,300	
Boone	57,700		3,300		5,400	1,016,500			249,700		194,500		52,800	1,579,900	20,900	
Raccoon	2,000		100		500	1,217,000			86,800		52,900		1,000	1,360,300	27,500	
Sub-total Des Moines	409,000		170,100		144,800	7,208,500			1,622,000		1,887,500		1,630,000	13,071,900	161,360	1
Total Mississippi	576,900		244,400		440,300	15,020,400			2,416,900	1,000	2,451,400	56,500	1,781,900	22,989,700	392,041	4
MISSOURI BASIN																
Big Sioux	12,000				8,500	960,000	26,000		15,000		72,000	500	3,400	1,097,400	37,600	
Floyd						220,000			1,200		4,500		8,900	234,600	8,700	
Little Sioux	55,000	6,000	35,000	5,000	15,000	660,000	10,500	1,500	180,000	4,000	450,000	10,000	140,000	1,572,000	68,000	
Loup and tribs.	8,000	8,000	25,000	1,500	3,000	62,000	8,000	1,200	6,500	9,000	7,000	2,000	11,000	152,200	6.500	
Elkhorn-Omaha Cr.	35,000	25,000	25,000		50,000	135,000	10,000		40,000		45,000		11,500	376,500	14,500	
Nemaha-Little Nemaha	17,900		14,400			910,900		500		10,000	380,000			1,333,700	40,320	
Total Missouri	127,900	39,000	99,400	6,500	76,500	2,947,900	54,500	3,200	242,700	23,000	958,500	12,500	174,800	4,766,400	175,620	
GRAND TOTAL	$704,800	$39,000	$343,800	$6,500	$516,800	$17,968,300	$54,500	$3,200	$2,659,600	$24,000	$3,409,900	$69,000	$1,956,700	$27,756,100	567,661	4

Note: So far as practicable, figures in this table have been coordinated with Corps of Engineers and other Federal and State agencies.

Data in Miscellaneous column include costs of flood fighting, emergency protection, evacuation and reoccupation, and wages and income lost.

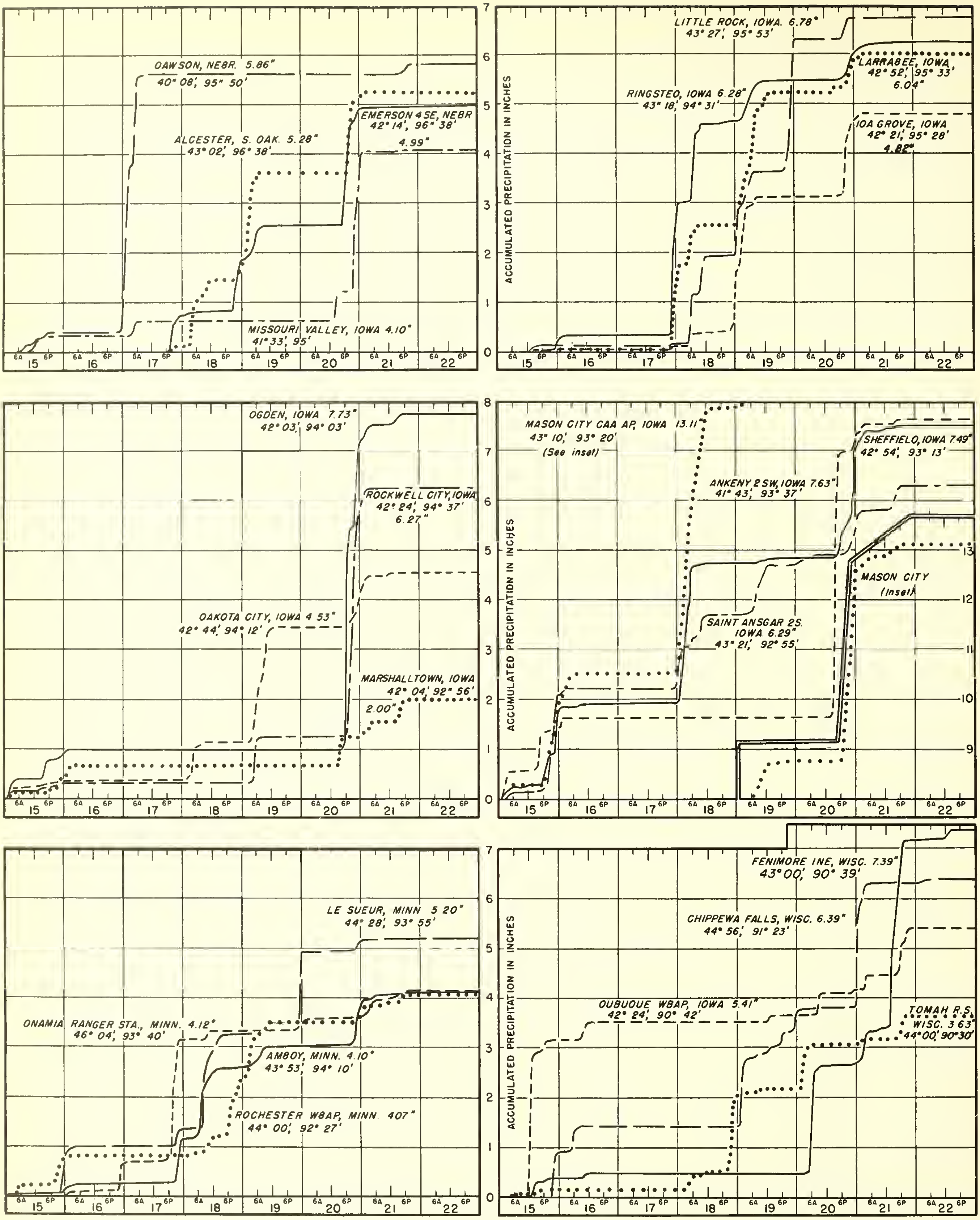


Figure 1 - Mass Rainfall Curves for Storm of June 15-22, 1954

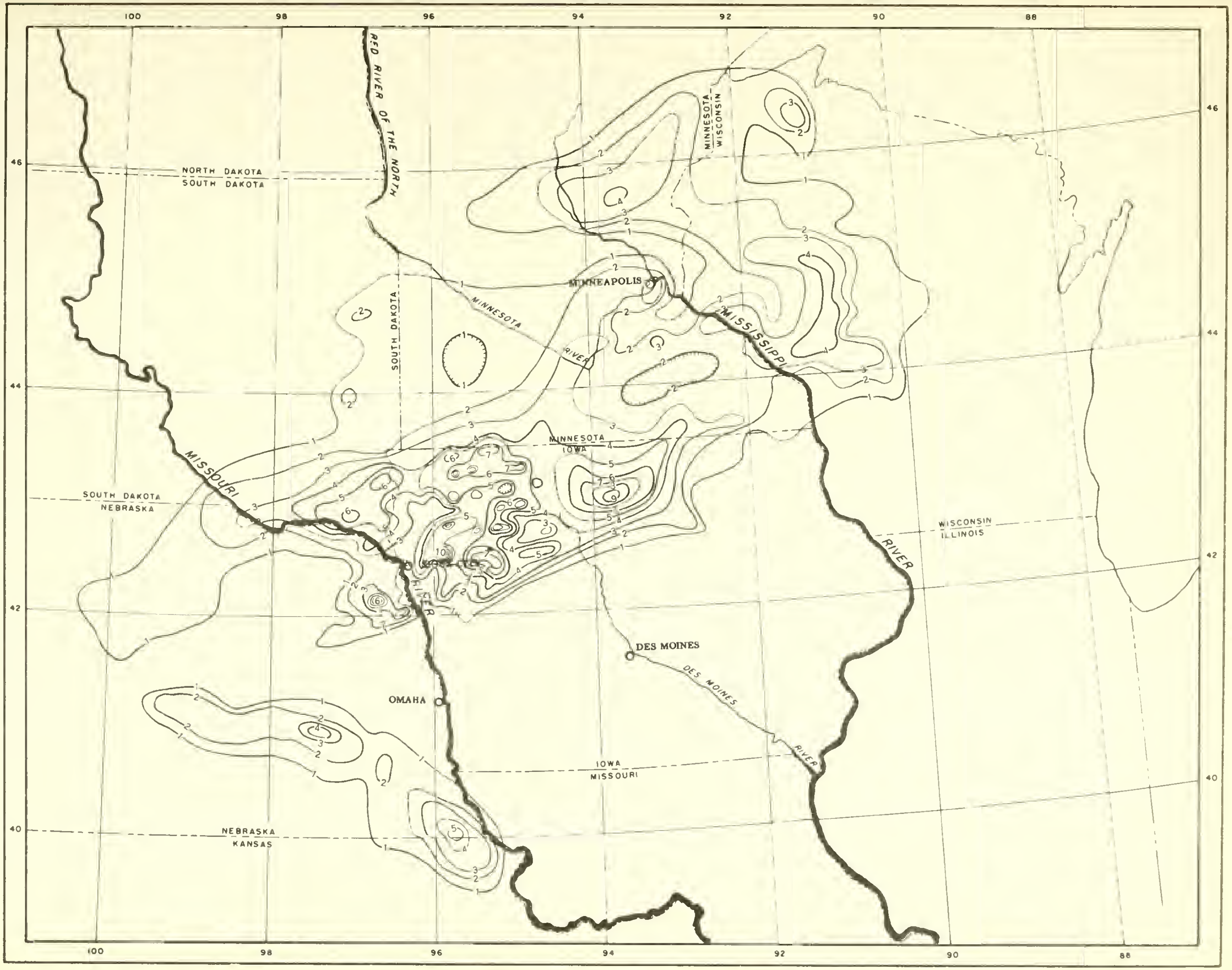


Figure 2 - Total Precipitation, June 17-19, 1954

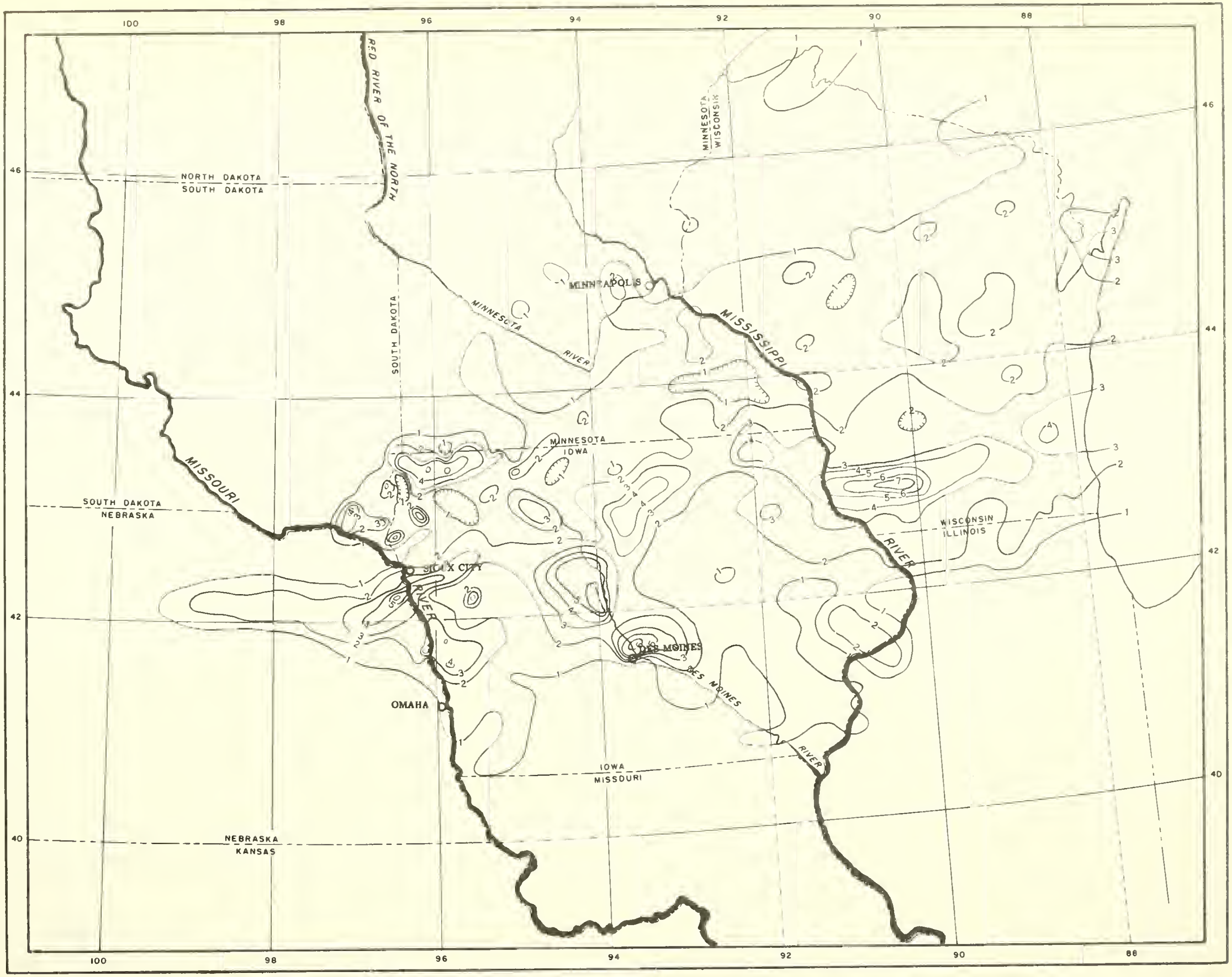


Figure 3 - Total Precipitation, June 20-22, 1954

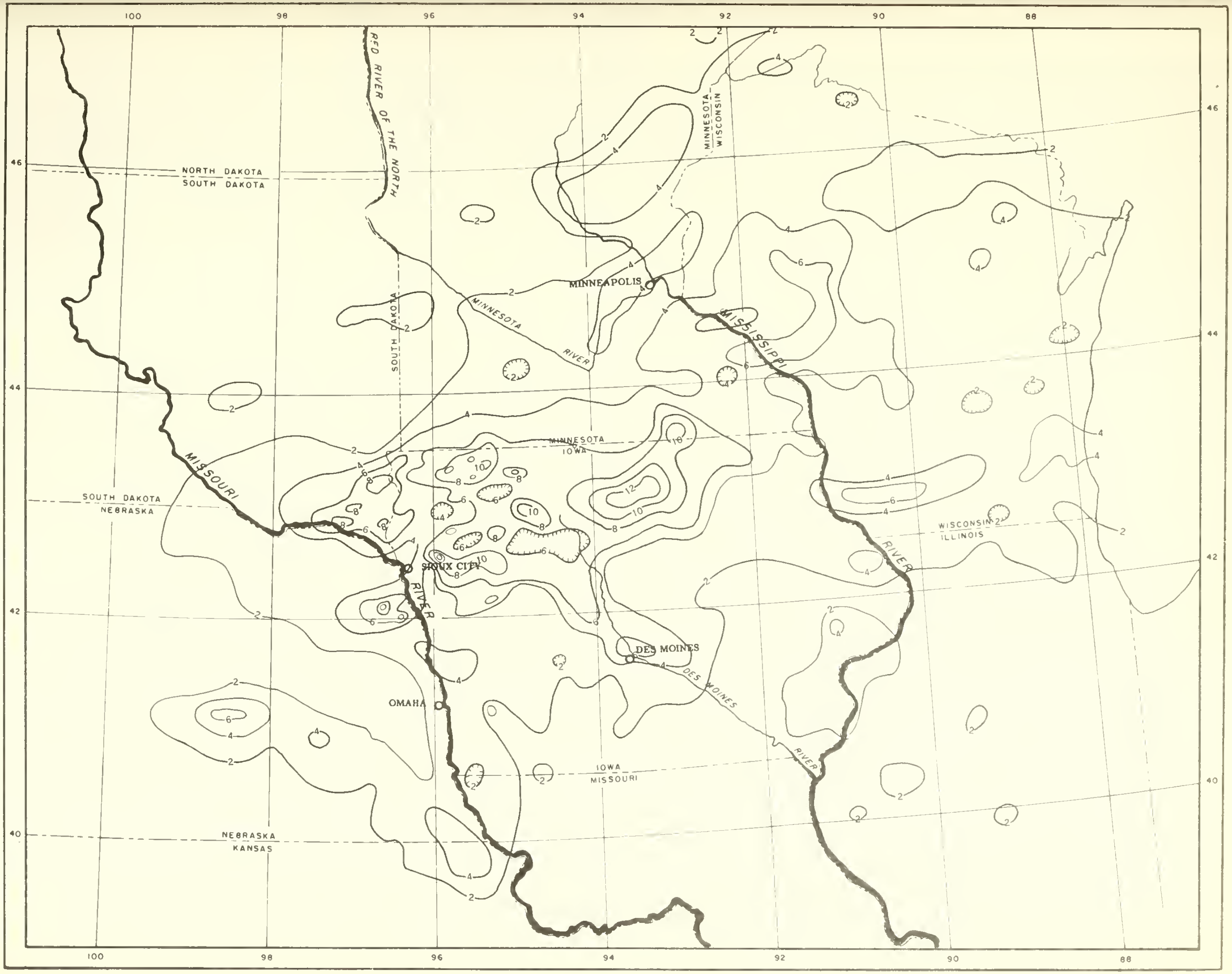


Figure 4 - Total Precipitation, June 15-22, 1954

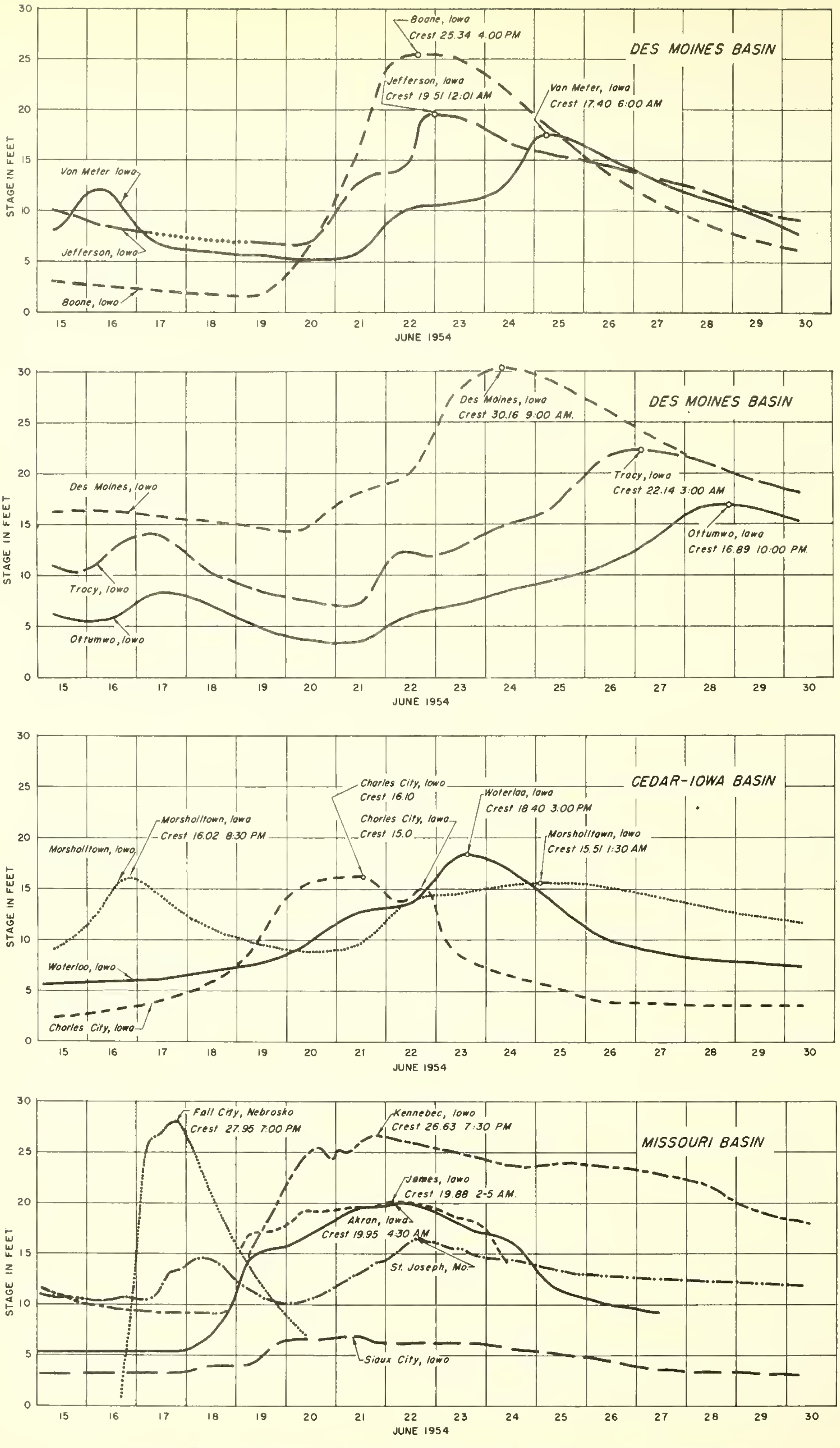


Figure 5 - River Stage Graphs, June 15-30, 1954

RADIOSONDE DATA

Average monthly values

Table 20

OCTOBER 1954

Standard pressure surface (mb.)	ALBUQUERQUE, N. MEX. (840 MB.)				ATLANTA, GA. (985 MB.)				BISMARCK, N. DAK. (957 MB.)				BOISE, IDAHO (918 MB.)				BROWNSVILLE, TEX. (1015 MB.)				BUFFALO, N. Y. (995 MB.)				BURRWOOD, LA. (1018 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,619	16.6	39	31	309	17.2	64	31	505	6.1	69	31	868	10.0	48	31	7	23.6	83	27	221	11.8	87	31	3	23.1	74
1000---	31	90			31	176			31	142			31	142			31	138	24.4	74	27	135	8.6		31	158	22.3	72
950----	31	547			31	617	18.4	51	31	572	6.9	62	31	580			31	588	21.5	74	27	567	12.0	69	31	603	19.2	71
900----	31	1,019			31	1,080	15.1	55	31	1,012	6.8	55	31	1,031	13.2	36	31	1,054	18.7	71	27	1,018	9.4	73	31	1,065	16.1	67
850----	31	1,510			31	1,561	11.8	61	31	1,480	4.8	54	31	1,510	11.2	33	31	1,543	16.2	63	27	1,490	7.0	69	31	1,550	13.6	59
800----	31	2,030	16.1	31	31	2,066	9.4	55	31	1,973	2.7	56	31	2,013	8.1	32	31	2,057	13.8	53	27	1,987	4.6	61	31	2,060	11.6	48
750----	31	2,581	12.2	34	31	2,607	6.7	51	31	2,501	.6	51	31	2,548	4.7	37	31	2,606	11.4	49	27	2,513	2.0	57	31	2,599	9.1	43
700----	31	3,148	7.9	38	31	3,163	4.0	45	31	3,044	- 2.1	55	31	3,101	1.1	42	31	3,173	8.4	43	27	3,065	- 1.1	57	31	3,166	6.2	41
650----	31	3,757	3.5	42	30	3,767	.8	37	31	3,638	- 5.4	51	31	3,700	- 2.3	39	31	3,789	4.9	40	26	3,653	- 4.2	57	30	3,775	2.0	42
600----	31	4,399	- 1.0	43	30	4,401	- 2.8	31	31	4,253	- 9.1	48	31	4,324	- 6.2	42	31	4,430	1.0	37	26	4,281	- 7.6	54	30	4,418	- .8	36
550----	31	5,085	- 5.3	38	30	5,088	- 6.6		31	4,925	-13.3	41	30	5,004	-10.0	36	31	5,126	- 3.0	33	26	4,953	-11.3	47	30	5,109	- 4.7	31
500----	31	5,830	- 9.9		29	5,821	-11.9		31	5,640	-18.1	39	30	5,729	-14.3	30	31	5,874	- 7.9	31	26	5,680	-15.5	44	30	5,851	- 9.7	31
450----	31	6,644	-15.6		28	6,626	-17.6		31	6,428	-23.3	38	30	6,524	-19.8		31	6,693	-13.5	29	26	6,470	-20.6		30	6,664	-15.3	28
400----	30	7,513	-22.2		28	7,485	-24.1		31	7,270	-29.4	41	30	7,383	-26.0		31	7,570	-19.9	29	26	7,330	-26.7	44	30	7,536	-21.7	27
350----	30	8,479	-29.6		27	8,437	-31.5		31	8,209	-36.3	36	30	8,335	-33.3		31	8,546	-27.1	34	26	8,280	-33.2	49	30	8,505	-29.1	
300----	30	9,558	-38.3		27	9,509	-39.5		31	9,261	-43.7		30	9,399	-41.5		31	9,639	-35.0		26	9,346	-40.8		30	9,587	-37.4	
250----	30	10,787	-47.0		27	10,731	-48.0		31	10,466	-50.2		29	10,619	-49.1		31	10,885	-44.3		25	10,558	-48.7		30	10,820	-46.5	
200----	30	12,238	-54.8		27	12,175	-55.4		31	11,908	-53.9		29	12,060	-55.3		30	12,344	-55.1		25	11,997	-56.1		29	12,264	-55.7	
175----	29	13,088	-58.7		27	13,019	-58.9		31	12,761	-55.6		29	12,907	-57.6		29	13,185	-61.0		22	12,868	-59.3		29	13,106	-59.9	
150----	28	14,040	-63.2		26	13,968	-61.8		30	13,739	-57.5		28	13,881	-59.4		28	14,128	-66.5		22	13,826	-62.2		27	14,059	-64.6	
125----	28	15,149	-67.2		24	15,094	-65.5		29	14,886	-59.2		28	15,015	-61.7		26	15,218	-70.2		18	14,925	-63.5		26	15,157	-68.6	
100----	26	16,478	-69.0		21	16,437	-65.5		28	16,278	-60.0		28	16,393	-62.1		20	16,538	-72.5		9	16,243	-61.5		22	16,483	-70.2	
80-----	25	17,823	-66.1		17	17,789	-63.2		25	17,664	-58.7		23	17,775	-60.7		16	17,855	-68.7		8	17,656	-61.7		19	17,821	-66.9	
60-----	23	19,595	-61.0		15	19,560	-60.1		20	19,467	-57.9		28	19,573	-59.0		12	19,612	-61.5		5	19,472	-59.4		17	19,583	-62.6	
50-----	23	20,733	-59.0		11	20,700	-59.3		17	20,628	-57.9		25	20,720	-58.5		12	20,744	-60.6						17	20,709	-61.1	
40-----	22	22,144	-56.8		8	22,094	-57.9		11	22,048	-56.8		20	22,120	-57.1		12	22,140	-57.7						13	22,089	-59.1	
30-----	12	23,968	-54.7						6	23,903	-53.1		7	23,931	-54.9		9	23,965	-55.2						8	23,916	-55.9	

Standard pressure surface (mb.)	CARIBOU, ME. (992 MB.)				CHARLESTON, S. C. (1018 MB.)				COLUMBIA, MO. (990 MB.)				DODGE CITY, KANS. (926 MB.)				EL PASO, TEX. (882 MB.)				ELY, NEV. (811 MB.)				GLASGOW, MONT. (941 MB.)			
SURFACE	31	191	6.2	83	31	13	17.1	81	31	238	13.9	75	31	792	13.2	64	31	1,195	20.3	42	31	1,908	8.1	46	31	648	7.3	61
1000---	31	127			31	165	19.8	67	31	148			31	136			31	94			31	124			31	138		
950----	31	550	6.3	71	31	611	17.6	59	31	587	14.2	63	31	575			31	553			31	569			31	573	1.8	
900----	31	991	4.6	70	31	1,066	14.9	56	31	1,040	12.1	64	31	1,033	14.2	52	31	1,029			31	1,027			31	1,015	8.6	46
850----	31	1,455	2.5	69	31	1,548	12.2	55	31	1,517	10.3	57	31	1,514	12.6	54	31	1,518	20.2	36	31	1,508			31	1,486	6.0	45
800----	31	1,943	- .1	69	31	2,054	10.1	45	31	2,021	8.2	58	31	2,021	10.3	53	31	2,038	16.6	39	31	2,016	11.4	30	31	1,979	2.9	46
750----	31	2,466	- 2.5	63	31	2,597	7.6	38	31	2,555	5.4	54	31	2,565	7.8	47	31	2,595	12.6	42	31	2,556	9.1	35	31	2,506	- .1	47
700----	31	3,004	- 4.4	56	31	3,154	4.8	36	31	3,112	2.2	51	31	3,122	4.5	44	31	3,159	8.4	43	31	3,121	5.1	34	31	3,048	- 3.3	46
650----	31	3,591	- 7.2	51	31	3,761	1.6	33	31	3,708	- 1.4	50	31	3,727	1.1	40	31	3,773	4.1	41	31	3,726	.9	36	31	3,639	- 6.8	43
600----	31	4,205	- 9.9	45	31	4,395	- 1.9		31	4,340	- 5.3	50	31	4,361	- 2.7	37	31	4,413	.0	36	31	4,360	- 3.2	36	31	4,252	- 9.9	46
550----	31	4,879	-13.3	42	31	5,087	- 6.3		31	5,018	- 9.1	45	31	5,048	- 7.5	37	31	5,107	- 4.4		31	5,046	- 7.3	35	30	4,918	-14.1	45
500----	31	5,591	-17.5	39	31	5,820	-11.1		31	5,750	-13.6	43	31	5,781	-12.4		31	5,848	- 9.4		31	5,779	-12.2	36	30	5,632	-19.1	43
450----	31	6,385	-22.5	39	31	6,633	-16.7		31	6,548	-19.2	41	31	6,583	-17.9		31	6,668	-15.2		31	6,587	-17.9	32	30	6,416	-24.0	39
400----	31	7,228	-28.1	38	31	7,494	-23.0		31	7,408	-25.5	39	31	7,448	-24.3		31	7,533	-22.0		31	7,447	-24.4		30	7,259	-29.7	30
350----	30	8,177	-34.8		31	8,457	-30.2		31	8,362	-32.7		31	8,407	-31.4		31	8,499	-29.6		31	8,405	-32.0		30	8,197	-36.5	38
300----	30	9,234	-42.2		31	9,532	-39.0		31	9,429	-40.6		30	9,483	-39.0		31	9,579	-38.1		29	9,473	-40.4		30	9,247	-43.8	
250----	30	10,445	-49.8		30	10,755	-47.5		31	10,648	-48.3		30	10,710	-47.3		31	10,808	-46.9		29	10,692	-48.1		30	10,450	-50.8	
200----	30	11,882	-55.2		30	12,203	-55.2		30	12,089	-55.1		30	12,161	-54.6		31	12,256	-55.9		28	12,143	-54.6		30	11,889	-54.3	
175----	30	12,730	-57.0		30	13,047	-59.1		30	12,936	-58.0		30	13,008	-58.3		31	13,095	-60.9		28	12,991	-58.1		30	12,741	-55.5	
150----	29	13,712	-59.3		30	14,003	-63.4		30	13,898	-61.4		29	13,961	-62.0		31	14,041	-65.8		27	13,955	-61.4		30	13,721	-56.3	
125----	28	14,839	-60.0		29	15,108	-67.2		29	15,018	-64.4		28	15,073	-65.0		29	15,125	-70.2		27	15,078	-64.3		30	14,873	-58.1	
100----	25	16,216	-59.3		26	16,460	-68.5		28	16,369	-64.4		24	16,420	-65.9		24	16,439	-71.4		25	16,433	-66.1		28	16,271	-58.4	
80-----	22	17,612	-58.6		21	17,799	-66.3		27	17,735	-63.2		21	17,767	-63.5		22	17,764	-67.3		24	17,793	-63.6		27	17,676	-58.1	
60-----	19	19,436	-58.3		20	19,564	-61.6		24	19,501	-59.7		17	19,530	-60.6		17	19,523	-61.6		22	19,571	-61.1		26	19,488	-57.3	
50-----	13	20,565	-56.8		20	20,697	-59.9		21	20,646	-58.8		17	20,669	-58.8		17	20,650	-59.6		19	20,706	-59.9		23	20,645	-57.1	
40-----	10	21,977	-53.8		18	22,103	-57.7		19	22,048	-57.5		12	22,073	-58.6		15	22,060	-57.5		13	22,125	-57.4		19	22,064	-56.8	
30-----	6	23,912	-50.8		12	23,924	-56.2		12	23,902	-55.0		6	23,879	-56.7		6	23,863	-56.1		8	23,958	-54.2		7	23,908	-55.5	
20-----					6	26,526	-52.0																					

Standard pressure surface (mb.)	GRAND JUNCTION, COLO. (853 MB.)				GREAT FALLS, MONT. (890 MB.)				GREEN BAY, WIS. (992 MB.)				GREENSBORO, N. C. (988 MB.)				HATTERAS, N. C. (1019 MB.)				INTERNAT. FALLS, MINN. (973 MB.)				LAKE CHARLES, LA. (1018 MB.)			
SURFACE	31	1,474	13.3	48	31	1,122	6.6	59	31	210	7.7	80	31	273	13.8	76	30	3	19.5	79	31	360	4.2	78	31	5	20.4	78
1000---	31	112			31	145			31	141	5.9		31	171			30	163	19.6	70	31	132			31	156	21.4	71
950----	31	561			31	581			31	569	8.6	67	31	610	16.7	53	30	604	16.6	65	31	557	5.7	68	31	601	19.4	67
900----	31	1,026			31	1,030			31	1,012	6.8	63	31	1,067	13.6	55	30	1,062	13.7	62	31	994	4.2	63	31	1,064	16.6	66
850----	31	1,508	14.1	43	31	1,498	6.9	50	31	1,480	4.8	56	31	1,546	10.5	58	30	1,541	11.3	53	31	1,456	1.5	60	31	1,549	14.0	62
800----	31	2,021	13.6	35	31	1,993	3.8	52	31	1,973	3.2	52	31	2,049	8.0	58	30	2,045	9.2	42	31	1,944	- .6	61	31	2,058	11.2	55
750----	31	2,566	9.6	37	31	2,523	1.0	53	31	2,497	.9	53	31	2,584	5.8	48	30	2,584	7.1	33	31	2,461	- 3.0	55	31	2,599	8.6	49
700----	31	3,128	5.5	40	31	3,066	- 2.5	52	31	3,046	- 1.6	53	31	3,142	3.1	40	30	3,141	4.1	31	31	3,002	- 5.3	40	31	3,163	6.1	40
650----	31	3,737	1.2	42	31	3,656	- 5.9	50	31	3,637	- 4.7	50	31	3,745	.1	36	29	3,750	.8		31	3,584	- 8.7	45	31	3,771	2.8	39
600----	31	4,369	- 3.1	41	31	4,275	- 9.1	47	31	4,259	- 8.3	46	31	4,376	- 3.9	40	29	4,384	- 3.0		31	4,196	-12.0	45	31	4,410	- .7	37
550----	31	5,053	- 7.6	43	31	4,948	-13.2	44	31	4,929	-12.6	42	31	5,062	- 7.6	37	29	5,073	- 7.2		30	4,858	-16.0	43	31	5,101	- 4.8	33
500----	30	5,785	-11.9	35	31	5,662	-18.0	40	31	5,650	-16.6	33	31	5,794	-12.5	40	29	5,803	-12.1		29	5,565	-20.7	42	31	5,842	- 9.5	
450----	30	6,594	-17.5		31	6,450	-23.3	39	31	6,442	-21.5	33	31	6,600	-17.8	36	29	6,614	-17.3		28	6,335	-26.0	42	31	6,657	-15.3	
400----	30	7,454	-24.2		31	7,294	-29.2	39	31	7,293	-27.3	37	31	7,461	-23.8	33	29	7,474	-23.7		26	7,164	-32.1		31	7,526	-21.8	
350----	30	8,412	-31.6		31	8,234	-35.6	38	31	8,241	-33.8		31	8,422	-30.8		29	8,435	-31.1		26	8,093	-39.1		28	8,491	-29.0	
300----	30	9,483	-40.0		31	9,290	-43.0		31	9,304	-40.8		30	9,505	-39.2		29	9,510	-38.9		26	9,133	-45.6		28	9,574	-37.7	
250----	30	10,704	-48.1		31	10,497	-50.6		31	10,523	-48.3		30	10,730	-47.3		28	10,741	-46.9		26	10,331	-50.5		28	10,798	-46.6	
200----	30	12,148	-55.2		31	11,933	-55.7		31	11,970	-54.4		29	12,184	-54.3		28	12,192	-55.1		25	11,794	-52.8		27	12,255	-54.7	
175----	30	12,994	-58.1		31	12,781	-56.8		30	12,814	-56.1		28	13,040	-57.6		28	13,037	-58.8		24	12,645	-53.9		27	13,099	-59.4	
150----	30	13,956	-61.5		30	13,747	-58.1		30	13,788	-58.3		28	14,004	-61.3		28	13,996	-62.7		22	13,618	-56.0		27	14,052	-64.0	
125----	29	15,075	-64.6		29	14,888	-59.2		30	14,929	-60.4		27	15,122	-64.6		28	15,108	-66.4		20	14,767	-57.4		27	15,157	-68.0	
100----	27	16,432	-66.2		28	16,282	-59.2		28	16,317	-60.5		24	16,478	-65.8		28	16,454	-67.1		20	16,176	-57.6		26	16,409	-70.3	
80-----	26	17,785	-64.4		27	17,684	-58.3		25	17,708	-60.1		23	17,832	-63.0		28	17,805	-64.9		20	17,583	-57.6		23	17,817	-67.7	
60-----	26	19,556	-60.7		24	19,488	-57.8		22	19,504	-58.3		22	19,611	-59.4		23	19,571	-61.1		20	19,402	-57.3		19	19,574	-61.6	
50-----	25	20,688	-59.6		23	20,641	-58.0		22	20,651	-58.0		18	20,776	-58.4		22	20,708	-59.3		18	20,552	-56.6		16	20,703	-60.0	
40-----	23	22,085	-57.6		20	22,039	-57.0		16	22,038	-57.5		15	22,201	-55.7		19	22,122	-57.8		14	21,948	-56.1		15	22,095	-57.8	
30-----	20	23,908	-55.7		14	23,880	-55.0		9	23,863	-55.4		12	24,050	-52.8		18	23,956	-54.8		10	23,778	-54.2		13	23,924	-55.5	
20-----	12	26,482	-54.4																		7	26,440	-51.5					

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative bumidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

OCTOBER 1954

Standard pressure surface (mb.)	LANDER, WYO. (830 MB.)				LAS VEGAS, NEV. (936 MB.)				LITTLE ROCK, ARK. (1009 MB.)				MAZATLAN, MEXICO (1008 MB.)				MEDFORD, ORE. (970 MB.)				MIAMI, FLA. (1015 MB.)				MIDLAND, TEX. (917 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,696	7.8	52	31	660	21.6	21	31	79	17.5	74	31	14	28.1	77	31	401	13.2	60	31	4	24.0	77	31	871	18.3	59
1,000--	31	127			31	80			31	158	18.5	66	31	91	27.2	77	31	143			31	137	24.0	72	31	120		
950----	31	566			31	532			31	604	17.7	59	31	552	24.1	77	31	579	15.5	46	31	588	20.9	75	31	569		
900----	31	1,024			31	1,004	23.8	20	31	1,059	15.3	59	31	1,016	21.7	73	31	1,035	13.3	45	31	1,051	17.7	77	31	1,035	19.6	51
850----	31	1,501			31	1,499	19.6	22	31	1,542	12.7	57	31	1,511	18.8	66	31	1,513	10.2	46	31	1,538	14.8	76	31	1,525	17.2	47
800----	31	2,005	9.1	38	31	2,016	15.4	25	31	2,049	9.9	53	31	2,030	16.2	57	31	2,014	7.2	47	31	2,049	12.4	65	31	2,041	14.4	48
750----	31	2,543	6.4	33	31	2,561	10.8	29	31	2,588	7.4	49	31	2,586	12.8	58	31	2,546	4.4	44	31	2,592	10.2	50	31	2,592	11.3	45
700----	31	3,098	2.5	36	31	3,129	6.9	30	31	3,148	4.5	45	30	3,154	8.9	59	31	3,101	1.5	35	31	3,160	7.5	40	31	3,157	8.5	40
650----	31	3,696	-1.5	42	31	3,737	3.4		31	3,753	1.1	45	29	3,772	4.6	64	31	3,701	-1.4	35	31	3,771	4.1	35	31	3,771	4.6	39
600----	31	4,325	-5.6	39	31	4,378	-.6		31	4,388	-2.5	42	29	4,410	.3	65	31	4,329	-5.2	38	31	4,414	.5	31	30	4,411	.7	33
550----	31	5,005	-9.8	38	31	5,065	-5.6		31	5,078	-6.6	41	29	5,103	-3.8	66	31	5,010	-8.9		31	5,105	-3.9		30	5,104	-3.7	
500----	31	5,731	-14.3	36	31	5,807	-11.2		31	5,812	-11.3	36	29	5,850	-8.2	58	31	5,739	-13.2		31	5,852	8.9		30	5,850	-8.7	
450----	31	6,531	-19.9	35	31	6,613	-17.5		31	6,624	-16.7		27	6,668	-13.2		31	6,540	-19.1		29	6,670	-14.2		30	6,665	-14.6	
400----	31	7,384	-26.1	34	31	7,478	-24.2		31	7,487	-22.9		25	7,549	-18.4		30	7,398	-25.7		29	7,546	-20.3		30	7,539	-21.2	
350----	31	8,334	-33.5		31	8,435	-31.8		31	8,450	-30.1		23	8,530	-26.0		29	8,356	-32.8		28	8,521	-27.7		30	8,509	-28.7	
300----	31	9,396	-42.1		31	9,506	-39.9		31	9,528	-38.2		20	9,630	-34.3		27	9,425	-41.1		28	9,611	-35.6		30	9,592	-37.2	
250----	31	10,605	-50.0		31	10,727	-48.0		30	10,755	-47.1		12	10,889	-44.1		26	10,641	-49.9		28	10,855	-44.6		30	10,826	-45.6	
200----	30	12,035	-56.4		31	12,173	-55.4		29	12,204	-54.4						26	12,075	-56.5		27	12,317	-55.1		29	12,282	-54.1	
175----	30	12,879	-58.0		31	13,016	-59.1		29	13,051	-58.1						26	12,917	-58.1		27	13,159	-60.6		29	13,128	-58.7	
150----	30	13,844	-60.3		30	13,967	-63.2		29	14,012	-62.0						26	13,884	-59.8		26	14,108	-66.1		29	14,082	-63.8	
125----	30	14,973	-62.8		26	15,072	-66.6		29	15,128	-65.7						26	15,016	-62.4		26	15,200	-70.6		26	15,169	-67.7	
100----	29	16,347	-63.5		24	16,420	-68.0		29	16,475	-67.1						23	16,392	-62.8		23	16,515	-72.8		25	16,500	-70.4	
80-----	29	17,720	-61.9		23	17,763	-66.2		25	17,020	-65.0						21	17,766	-61.2		19	17,835	-67.7		23	17,840	-67.4	
60-----	26	19,508	-59.9		22	19,527	-62.6		23	19,599	-60.6						19	19,563	-59.6		17	19,594	-63.5		18	19,599	-61.3	
50-----	19	20,650	-58.9		22	20,656	-60.4		19	20,753	-59.0						18	20,698	-59.0		17	20,716	-61.8		18	20,735	-59.0	
40-----	14	22,046	-57.8		21	22,055	-58.6		15	22,153	-56.7						14	22,113	-57.6		13	22,107	-58.5		18	22,137	-57.4	
30-----	8	23,838	-57.6		17	23,869	-56.1		12	23,981	-54.4						6	23,939	-54.9		11	23,921	-56.0		17	23,961	-55.6	
20-----																					5	26,506	-51.6					

Standard pressure surface (mb.)	NANTUCKET, MASS. (1016 MB.)				NASHVILLE, TENN. (999 MB.)				NORTH PLATTE, NEBR. (919 MB.)				OAKLAND, CALIF. (1016 MB.)				OKLAHOMA CITY, OKLA. (971 MB.)				OMAHA, NEBR. (970 MB.)				PHOENIX, ARIZ. (972 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	14	13.5	85	31	177	15.5	78	31	848	8.2	73	31	6	16.0	66	31	391	16.8	71	31	300	10.8	78	31	341	25.3	35
1,000--	31	145	15.0	79	31	167	13.9		31	138			31	139	15.9	63	31	140			31	145			31	89		
950----	31	578	13.7	69	31	605	15.6	61	31	572			31	581	15.8	50	31	584	17.7	62	31	582	11.3	67	31	549	27.8	19
900----	31	1,034	11.2	64	31	1,062	12.6	63	31	1,020	10.4	61	31	1,034	14.9	39	31	1,043	16.4	58	31	1,027	10.6	66	31	1,020	24.5	20
850----	31	1,509	8.9	57	31	1,540	10.2	63	31	1,495	8.8	57	31	1,516	13.0	28	31	1,527	14.1	55	31	1,502	8.8	65	31	1,516	20.6	23
800----	31	2,009	6.6	53	31	2,043	8.4	53	31	1,996	7.7	52	31	2,022	10.5	28	31	2,036	11.2	54	31	2,003	7.1	61	31	2,036	16.4	27
750----	31	2,543	4.6	47	31	2,581	5.9	46	31	2,531	5.3	48	31	2,569	8.6	24	31	2,579	8.6	47	31	2,539	5.0	51	31	2,584	12.4	27
700----	31	3,097	2.0	48	31	3,136	2.8	45	31	3,087	2.4	42	31	3,125	5.7	22	31	3,140	5.7	40	31	3,092	1.8	46	31	3,155	8.4	25
650----	31	3,692	-1.1	46	31	3,738	-.6	44	31	3,686	-1.2	41	30	3,730	1.9		31	3,744	2.0	40	31	3,688	-1.8	44	31	3,769	4.8	
600----	31	4,326	-4.6	40	31	4,367	-4.3	39	31	4,316	-5.0	38	29	4,366	-2.6		31	4,384	-2.1	38	31	4,318	-5.7	48	31	4,411	.6	
550----	31	5,006	-8.3	35	31	5,053	-8.3	37	31	4,996	-9.4	37	29	5,049	-7.2		31	5,072	-6.3	31	31	4,998	-9.7	43	31	5,103	-4.3	
500----	31	5,740	-12.9		31	5,781	-12.9	35	31	5,724	-14.4	31	29	5,786	-12.3		31	5,808	-11.3	33	31	5,726	-14.6		30	5,847	-9.5	
450----	31	6,542	-18.0		31	6,589	-18.1		31	6,522	-20.2		29	6,590	-18.2		31	6,620	-16.8		31	6,527	-20.5		29	6,669	-15.4	
400----	31	7,407	-24.1		31	7,447	-24.1	33	31	7,376	-26.5		29	7,451	-24.9		31	7,482	-23.0		29	7,387	-25.8		29	7,534	-22.1	
350----	31	8,366	-31.1		31	8,407	-30.8		31	8,326	-33.6		29	8,406	-32.8		31	8,445	-30.1		29	8,338	-33.3		29	8,500	-30.0	
300----	31	9,440	-39.3		31	9,484	-38.4		31	9,389	-41.6		28	9,469	-41.0		31	9,522	-38.4		29	9,402	-41.3		29	9,578	-38.5	
250----	31	10,664	-47.9		31	10,713	-46.9		31	10,604	-48.8		28	10,684	-49.2		31	10,750	-47.2		29	10,619	-48.6		29	10,808	-46.8	
200----	31	12,108	-55.4		31	12,167	-54.0		31	12,049	-54.6		28	12,125	-55.5		31	12,199	-54.9		28	12,079	-55.4		29	12,261	-54.7	
175----	31	12,953	-58.3		31	13,017	-57.3		31	12,897	-57.8		27	12,976	-58.4		31	13,044	-58.4		27	12,919	-58.3		29	13,107	-58.9	
150----	31	13,915	-61.0		31	13,983	-60.9		31	13,861	-61.1		26	13,941	-61.3		31	14,004	-62.2		27	13,880	-61.6		29	14,063	-63.7	
125----	29	15,028	-63.5		30	15,100	-64.7		31	14,986	-63.8		20	15,057	-64.2		30	15,123	-66.2		26	14,993	-64.1		27	15,176	-68.1	
100----	29	16,395	-63.3		29	16,448	-65.8		28	16,351	-64.9		8	16,418	-64.1		29	16,469	-68.1		23	16,349	-64.1		27	16,508	-70.0	
80-----	26	17,763	-61.8		23	17,803	-63.6		26	17,711	-62.9						24	17,813	64.8		22	17,708	-62.7		25	17,848	-66.6	
60-----	23	19,564	-59.3		19	19,574	-60.4		24	19,487	-60.7						22	19,582	-60.8		18	19,492	-60.2		23	19,610	-61.9	
50-----	21	20,717	-57.9		17	20,713	-59.0		24	20,625	-59.3						22	20,719	-59.2		18	20,629	-59.5		20	20,754	-59.0	
40-----	18	22,126	-55.5		16	22,112	-57.2		22	22,039	-57.7						21	22,128	-57.1		16	22,024	-57.8		20	22,159	-57.0	
30-----	12	23,985	-52.6		10	23,970	-55.0		18	23,875	-56.2						15	23,966	-54.6		11	23,793	-56.5		17	23,980	-55.0	
20-----									6	26,527	-52.4																	

Standard pressure surface (mb.)	PITTSBURGH, PA. (977 MB.)				PORTLAND, ME. (1014 MB.)				RAPID CITY, S. DAK. (906 MB.)				ST. CLOUD, MINN. (979 MB.)				SAN ANTONIO, TEX. (989 MB.)				SAN JUAN, P. R. (1013 MB.)				SANTA MARIA, CALIF. (1007 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	375	12.2	78	31	20	9.9	84	31	966	7.2	63	31	316	6.2	81	31	243	22.3	64	30	19	24.8	85	31	71	12.7	78
1,000--	31	158			31	136	12.2	72	31	139			31	142			31	142			30	130	24.7	80	31	129	13.6	73
950----	31	595	12.3	71	31	568	11.2	67	31	573			31	569	7.4	69	31	590	21.4	64	30	586	22.1	78	31	572	17.5	45
900----	31	1,042	9.8	70	31	1,016	8.9	66	31	1,021	8.3	57	31	1,010	5.6	64	31	1,058	18.5	66	30	1,049	19.2	77	31	1,027	17.1	36
850----	31	1,515	7.2	69	31	1,487	6.3	65	31	1,494	8.4	49	31	1,476	4.4	58	31	1,546	15.5	67	30	1,540	16.3	74	31	1,512	14.8	31
800----	31	2,012	5.1	59	31	1,982	3.7	64	31	1,992	5.7	50	31	1,968	2.7	53	31	2,059	13.1	60	30	2,054	13.5	71	31	2,023	12.8	25
750----	31	2,543	2.6	57	31	2,509	1.7	54	31	2,524	3.4	49	31	2,493	.3	48	31	2,604	11.2	47	30	2,601	10.6	67	31	2,565	10.1	22
700----	31	3,093	-.2	57	31	3,058	-.9	50	31	3,075	.6	45	31	3,039	-2.5	44	31	3,174	8.4	37	30	3,169	7.6	61	31	3,132	6.7	
650----	31	3,684	-3.6	54	31	3,653	-4.1	46	31	3,673	-2.6	44	31	3,627	-5.6	41	31	3,789	4.9	37	30	3,784	4.2	52	31	3,741	3.2	
600----	31	4,312	-7.1	53	31	4,274	-7.3	39	31	4,297	-6.4	40	30	4,245	-9.3	40	31	4,431	.9	36	30	4,424	.7	46	31	4,380	-1.0	
550----	31	4,987	-11.2	45	31	4,951	-10.8	36	31	4,974	-10.8	38	30	4,916	-13.2		31	5,124	-3.6	34	30	5,123	-2.8	39	31	5,065	-5.9	
500----	31	5,712	-15.2	42	31	5,675	-15.0		31	5,697	-15.9	36	30	5,632	-17.9	34	31	5,871	-8.6	28	30	5,868	-7.1	39	31	5,807	-11.3	
450----	31	6,505	-20.2	41	31	6,471	-20.2		31	6,490	-21.5	34	30	6,419	-23.2		31	6,692	-14.4		30	6,698	-11.7		31	6,615	-17.1	
400----	31	7,364	-26.2	41	31	7,326	-26.1		31	7,341	-27.5	36	30	7,264	-29.1		31	7,562	-20.9		30	7,577	-17.6		31	7,479	-23.8	
350----	31	8,316	-32.9	41	31	8,278	-32.9		31	8,287	-34.5		30	8,204	-36.1		31	8,534	-28.2		30	8,562	-24.8		31	8,439	-31.4	
300----	31	9,382	-40.6		31	9,346	-40.4		30	9,345	-41.6		30	9,257	-43.1		31	9,622	-36.6		30	9,663	-33.6		31	9,512	-39.3	
250----	31	10,601	-48.2		31	10,564	-48.5		30	10,562	-48.3		30	10,466	-49.5		30	10,858	-45.3		30	10,914	-43.7		31	10,738	-47.3	
200----	31	12,045	-55.3		30	12,000	-55.5		29	12,006	-53.9		30	11,912	-53.4		29	12,314	-54.5		30	12,373	-55.8		31	12,187	-54.9	
175----	31	12,889	-58.5		30	12,846	-57.7		29	12,859	-56.1		29	12,771	-56.0		29	13,159	-59.4		30	13,209	-62.5		31	13,034	-58.2	
150----	30	13,849	-61.1		30	13,813	-60.2		29	13,831	-58.8		29	13,745	-58.1		28	14,112	-64.3		30	14,144	-69.5		31	13,995	-61.8	
125----	26	14,965	-63.8		29	14,944	-62.0		29	14,968	-60.8		29	14,887	-60.2		28	15,216	-68.4		29	15,217	-74.3		31	15,112	-65.6	
100----	16	16,323	-63.2		29	16,320	-62.2		29	16,350	-61.9		28	16,270	-60.5		25	16,540	-70.9		25	16,512	-75.1		31	16,460	-67.2	
80-----	11	17,709	-62.1		28	17,696	-60.4		28	17,730	-60.9		28	17,662	-59.3		21	17,860	-67.4		23	17,816	-70.5		29	17,810	-65.3	
60-----	7	19,474	-61.3		26	19,493	-58.5		27	19,518	-58.8		26	19,460	-58.3		19	19,620	-61.9		20	19,544	-64.2		27	19,576	-61.7	
50-----					24	20,642	-57.4		26	20,666	-58.7		25	20,604	-58.0		17	20,751	-59.6		19	20,662	-61.3		26	20,712	-59.7	
40-----					19	22,070	-55.5		25	22,073	-57.2		18	21,993	-57.1		15	22,154	-57.5		19	22,055	-58.7		23	22,118	-57.7	
30-----					9	23,891	-54.3		20	23,908	-55.4		13	23,804	-55.5		11	23,992	-55.3		13	23,868	-57.6		16	23,963	-54.8	
20-----									9	26,536	-53.1																	
15-----									5	28,367	-53.5																	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

OCTOBER 1954

Standard pressure surface (mb.)	S. STE. MARIE, MICH. (989 MB.)				SPOKANE, WASH. (934 MB.)				SWAN ISLAND, W. I. (1011 MB.)				TAMPA, FLA. (1017 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	221	7.0	87	31	722	7.9	62	31	10	26.5	82	31	7	21.0	81
1,000--	31	132	4.6		31	153			31	107	26.3	80	31	154	21.8	73
950----	31	558	6.6	70	31	584			31	565	23.1	82	31	600	19.6	70
900----	31	997	4.6	69	31	1,030	8.9	55	31	1,029	20.2	77	31	1,063	16.8	68
850----	31	1,462	3.3	66	31	1,502	6.2	53	31	1,521	17.3	71	31	1,548	14.3	61
800----	31	1,952	1.7	59	31	1,996	3.1	53	31	2,037	14.3	68	31	2,058	12.1	51
750----	31	2,475	- .4	54	31	2,518	.3	52	31	2,591	11.5	63	31	2,603	10.2	38
700----	31	3,020	- 2.7	51	31	3,066	- 3.0	50	31	3,154	8.6	58	31	3,168	7.5	35
650----	31	3,606	- 5.6	55	31	3,652	- 6.0	44	31	3,770	5.3	55	31	3,779	4.0	
600----	31	4,228	- 9.2	53	31	4,272	- 9.6	47	31	4,414	1.8	50	31	4,420	.3	
550----	30	4,893	-13.4	51	31	4,942	-13.5	38	31	5,113	- 1.8	46	31	5,115	- 4.0	
500----	30	5,611	-18.1	51	31	5,658	-18.0	39	31	5,865	- 6.1	45	31	5,857	- 9.0	
450----	29	6,394	-22.8	46	31	6,442	-23.5	41	30	6,695	-10.9	41	31	6,674	-14.7	
400----	28	7,259	-27.9	42	31	7,289	-29.0	41	30	7,579	-16.5	39	31	7,545	-21.1	
350----	27	8,200	-34.4		31	8,229	-35.7	41	30	8,569	-23.5	39	31	8,516	-28.4	
300----	24	9,265	-41.3		31	9,284	-43.2		29	9,676	-32.0	39	30	9,601	-36.7	
250----	20	10,513	-48.1		30	10,491	-50.9		28	10,938	-41.9		30	10,837	-45.4	
200----	14	11,936	-53.6		29	11,928	-55.4		27	12,410	-54.1		29	12,295	-54.5	
175----	13	12,776	-56.0		29	12,776	-56.8		26	13,251	-61.0		29	13,140	-59.2	
150----	8	13,790	-60.6		27	13,752	-58.2		25	14,191	-68.1		28	14,093	-63.6	
125----					21	14,885	-58.4		24	15,266	-73.7		27	15,205	-68.1	
100----					12	16,298	-59.5		18	16,560	-75.8		27	16,535	-70.3	
80-----									12	17,859	-70.0		25	17,863	-66.8	
60-----									11	19,596	-62.9		22	19,634	-61.6	
50-----									10	20,721	-60.0		22	20,768	-60.1	
40-----									7	22,114	-57.9		22	22,166	-58.0	
30-----									6	23,916	-56.8		17	23,986	-55.1	

Standard pressure surface (mb.)	TATOOSH ISLAND, WASH. (1013 MB.)				VERACRUZ, MEXICO (1013 MB.)				WASHINGTON, D. C. (1009 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	31	10.8	82	13	13	26.7		31	88	15.2	71
1,000--	31	142	11.3	72	13	126	25.7		31	161	16.9	66
950----	31	576	10.2	66	13	575	21.9		31	601	15.2	61
900----	31	1,018	7.6	66	13	1,043	18.8		31	1,053	11.8	63
850----	31	1,486	4.7	65	13	1,532	15.6		31	1,530	8.8	65
800----	31	1,978	2.1	59	12	2,047	12.4		31	2,030	6.5	61
750----	31	2,506	- .3	55	12	2,592	9.8		31	2,566	4.5	52
700----	31	3,047	- 2.9	53	12	3,158	7.1		31	3,118	1.5	47
650----	31	3,637	- 6.0	50	12	3,774	4.8		31	3,717	- 1.8	45
600----	31	4,254	- 9.6	49	11	4,413	1.3		30	4,344	- 5.2	40
550----	31	4,923	-13.9	51	11	5,107	- 2.4		30	5,028	- 8.7	35
500----	30	5,638	-18.5	49	11	5,859	- 7.0		30	5,755	-13.3	33
450----	30	6,426	-23.9	46	11	6,688	-12.2		30	6,560	-18.9	
400----	30	7,266	-29.6	44	11	7,566	-17.8		30	7,416	-25.2	37
350----	30	8,204	-36.3		11	8,550	-25.0		30	8,372	-31.8	
300----	29	9,257	-43.4		11	9,652	-33.5		30	9,444	-39.7	
250----	29	10,464	-50.2		10	10,907	-43.2		30	10,667	-47.9	
200----	28	11,898	-55.5		7	12,366	55.3		30	12,115	-54.8	
175----	28	12,747	-56.2		7	13,206	-61.6		20	12,970	-58.9	
150----	28	13,724	-56.6		7	14,146	-68.2		27	13,925	-62.3	
125----	27	14,878	-58.0		6	15,216	-74.5		27	15,041	-65.4	
100----	26	16,281	-57.9						26	16,388	-65.5	
80-----	25	17,691	-57.2						22	17,744	-63.3	
60-----	22	19,514	-56.3						21	19,516	-60.7	
50-----	21	20,670	-56.5						19	20,649	-58.9	
40-----	17	22,073	-56.9						15	22,032	-57.0	
30-----	12	23,890	-56.3						12	23,877	-53.7	

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20 *Air Force data for June 1954

Standard pressure surface (mb.)	DENVER, COLO. (829 MB.)				FT. WORTH, TEX. (990 MB.)				OGDEN, UTAH (851 MB.)				RANTOUL, ILL. (987 MB.)				ROME, N. Y. (994 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	1,661	21.7	32	30	178	29.9	46	30	1,450	18.6	41	30	227	22.2	72	30	146	16.4	76
1,000--	30	5			30	86			30	43			30	108			30	97		
950----	30	459			30	547	28.0	48	30	501			30	575	23.2	61	30	537	16.5	70
900----	30	940			30	1,022	24.2	54	30	969			30	1,028	20.8	60	30	995	14.1	70
850----	30	1,443			30	1,519	20.3	59	30	1,464	18.3	41	30	1,519	17.2	65	30	1,475	11.2	72
800----	30	1,970	20.6	33	30	2,039	16.3	65	30	1,982	15.7	37	30	2,034	14.0	62	30	1,979	8.4	69
750----	30	2,526	16.9	35	30	2,594	13.2	58	30	2,528	11.5	40	30	2,580	10.7	57	30	2,514	5.3	68
700----	30	3,107	12.3	39	30	3,164	10.2	43	30	3,098	6.9	44	30	3,148	7.3	54	30	3,070	2.0	67
650----	30	3,729	7.2	44	30	3,783	6.6	35	30	3,703	2.0	50	30	3,758	3.6	51	28	3,660	- 1.6	62
600----	30	4,376	1.8	48	30	4,428	2.6	32	30	4,343	- 2.8	54	30	4,399	- .5	48	28	4,292	- 5.1	54
550----	30	5,070	- 3.9	52	30	5,128	- 2.1	32	30	5,026	- 7.8	56	30	5,090	- 4.7	40	28	4,968	- 9.2	50
500----	30	5,814	-10.0	59	30	5,877	- 7.2	29	30	5,760	-12.6	54	30	5,832	- 9.5	36	28	5,700	-13.8	39
450----	30	6,624	-16.1	54	30	6,700	-12.5		30	6,562	-18.2	47	30	6,647	-14.9	32	28	6,495	-18.9	
400----	29	7,500	-22.1	43	30	7,580	-18.9		30	7,426	-24.5	48	30	7,519	-21.2		28	7,359	-24.9	
350----	28	8,467	-29.3		30	8,559	-26.4		29	8,381	-31.9		30	8,489	-28.6		28	8,315	-31.7	
300----	28	9,549	-37.5		29	9,655	-34.9		28	9,452	-40.1		29	9,573	-37.0		27	9,388	-39.5	
250----	28	10,780	-46.9		29	10,902	-44.3		28	10,672	-48.7		29	10,807	-46.5		27	10,612	-47.7	
200----	23	12,238	-56.2		25	12,356	-55.2		27	12,102	-55.6		28	12,248	-57.0		26	12,050	-55.9	
175----	23	13,078	-60.0		25	13,198	-60.5		27	12,949	-57.2		28	13,084	-61.4		25	12,887	-59.1	
150----	21	14,045	-63.4		23	14,142	-65.7		26	13,912	-58.5		27	14,041	-64.0		25	13,849	-60.3	
125----	17	15,155	-63.8		13	15,261	-69.2		24	15,049	-58.9		22	15,169	-66.3		24	14,980	-59.3	
100----	14	16,517	-64.3		7	16,580	-69.2		21	16,461	-59.8		16	16,536	-65.7		20	16,379	-60.3	
80-----	10	17,874	-60.4						18	17,853	-59.3		9	17,906	-62.8		18	17,782	-59.6	
60-----	10	19,678	-57.4						13	19,676	-56.5		6	19,711	-58.0		16	19,596	-57.3	
50-----	8	20,830	-56.0						13	20,837	-54.7						15	20,747	-55.8	
40-----	8	22,254	-54.0						12	22,280	-52.9						14	22,166	-53.9	
30-----									10	24,141	-50.8						8	24,015	-51.5	
20-----									8	26,809	-46.5									

* July data for the above Air Force stations will be included in the November issue of this publication.

Note: All observations scheduled at 0300, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20 Reprinted from the August 1954 issue with corrected Relative Humidity Data

Standard pressure surface (mb.)	ALBUQUERQUE, N. MEX. (840 MB.)				ATLANTA, GA. (983 MB.)				BISMARCK, N. DAK. (955 MB.)				BOISE, IDAHO (912 MB.)				BROWNSVILLE, TEX. (1013 MB.)				BUFFALO, N. Y. (993 MB.)				BURRWOOD, LA. (1016 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,619	24.3	42	31	309	26.3	68	31	505	19.7	73	31	868	22.6	38	31	7	27.7	81	30	221	18.1	82	31	3	28.0	79
1000----	31	48			31	154			31	105			31	59			31	126	27.0	79	30	122			31	146	27.3	77
950----	31	518			31	612	26.9	55	31	555	20.5	66	31	517			31	583	24.5	74	30	566	18.5	65	31	603	24.7	68
900----	31	1,006			31	1,088	24.0	56	31	1,020	19.6	55	31	987	24.3	27	31	1,053	22.5	60	30	1,026	15.2	71	31	1,073	22.0	64
850----	31	1,509			31	1,585	20.1	59	31	1,509	16.4	57	31	1,484	21.5	26	31	1,549	20.2	52	30	1,508	11.9	71	31	1,567	19.2	59
800----	31	2,041	22.2	38	31	2,105	16.2	62	31	2,023	13.5	55	31	2,004	17.0	29	31	2,070	17.4	49	30	2,013	9.1	67	31	2,087	16.1	52
750----	31	2,602	18.0	41	31	2,655	12.4	61	31	2,568	10.2	52	31	2,555	12.4	34	31	2,623	14.3	45	30	2,551	6.3	59	31	2,635	12.9	48
700----	31	3,184	13.2	47	31	3,227	8.7	57	31	3,134	6.2	52	31	3,124	7.5	39	31	3,197	10.7	40	30	3,109	3.4	55	31	3,209	9.5	43
650----	31	3,805	8.1	56	31	3,844	5.1	56	31	3,741	2.0	51	31	3,731	2.7	44	31	3,816	6.9	40	29	3,712	.4	47	31	3,821	5.9	42
600----	31	4,458	2.7	63	31	4,487	1.4	53	31	4,377	- 2.3	47	31	4,371	- 2.4	46	31	4,465	3.0	41	29	4,346	- 3.1	41	31	4,471	2.1	42
550----	31	5,156	- 2.4	66	31	5,187	- 2.3	46	31	5,064	- 6.5	41	31	5,057	- 7.5	45	31	5,169	- 1.2	39	29	5,032	- 6.9		31	5,174	- 2.0	42
500----	31	5,907	- 7.2	64	31	5,934	- 6.7	40	31	5,801	-11.5	37	31	5,791	-12.7	38	31	5,919	- 5.8	38	29	5,768	-11.5		31	5,920	- 6.6	37
450----	31	6,732	-12.0	51	30	6,759	-12.1	34	31	6,608	-17.2	38	31	6,595	-18.6	33	31	6,749	-11.1	34	29	6,577	-16.7		31	6,749	-12.0	38
400----	31	7,615	-17.6	45	29	7,638	-18.1	32	31	7,473	-23.5	39	31	7,454	-24.8		31	7,631	-17.2	35	29	7,444	-22.8		31	7,626	-18.1	34
350----	31	8,600	-24.2	38	29	8,621	-25.1		31	8,435	-30.7	39	31	8,411	-32.0		31	8,618	-24.4		29	8,409	-29.9		31	8,609	-23.3	
300----	31	9,705	-32.5	35	29	9,720	-33.8		30	9,510	-39.0		31	9,481	-40.0		31	9,722	-32.8		29	9,488	-38.0		31	9,709	-33.7	
250----	31	10,962	-42.3		28	10,972	-43.4		30	10,735	-48.1		31	10,703	-47.9		31	10,979	-42.8		29	10,719	-46.7		31	10,961	-43.3	
200----	31	12,433	-53.5		28	12,435	-54.7		30	12,179	-54.7		31	12,159	-52.0		31	12,448	-54.3		29	12,174	-54.0		31	12,426	-54.2	
175----	31	13,280	-59.4		28	13,278	-60.1		30	13,031	-55.4		30	13,025	-53.8		31	13,292	-60.1		29	13,025	-56.5		31	13,269	-59.9	
150----	29	14,231	-65.3		28	14,226	-65.2		30	14,009	-56.7		29	14,016	-54.5		31	14,240	-65.8		26	13,985	-58.6		31	14,220	-64.8	
125----	28	15,330	-69.2		27	15,326	-68.7		30	15,159	-58.8		27	15,182	-56.4		29	15,335	-70.3		18	15,114	-59.8		29	15,318	-69.2	
100----	24	16,658	-69.2		26	16,660	-67.4		29	16,556	-59.4		26	16,589	-57.6		28	16,655	-71.7		8	16,523	-60.8		29	16,644	-69.7	
80-----	21	18,005	-63.8		25	18,016	-63.7		29	17,956	-57.8		22	17,999	-56.9		24	17,978	-68.5						28	17,981	-66.8	
60-----	20	19,792	-58.1		24	19,799	-59.5		28	19,781	-55.0		21	19,833	-53.5		20	19,732	-62.1						23	19,742	-61.7	
50-----	20	20,946	-56.0		23	20,945	-57.6		27	20,950	-53.5		19	21,010	-52.8		19	20,868	-58.7						21	20,877	-59.4	
40-----	18	22,367	-53.7		21	22,358	-55.3		25	22,388	-51.8		15	22,454	-50.9		17	22,274	-56.0						11	22,286	-56.5	
30-----	12	24,219	-51.7		17	24,214	-51.7		22	24,267	-49.0		9	24,319	-49.2		13	24,116	-52.7									
20-----					5	26,873	-48.1		11	26,928	-47.0																	
15-----									5	28,823	-46.3																	

Standard pressure surface (mb.)	CARIBOU, ME. (989 MB.)				CHARLESTON, S. C. (1015 MB.)				COLUMBIA, MO. (987 MB.)				DODGE CITY, KANS. (923 MB.)				EL PASO, TEX. (882 MB.)				ELY, NEV. (809 MB.)				GLASGOW, MONT. (938 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	191	13.9	86	31	13	25.2	86	31	238	25.4	70	31	792	27.1	50	31	1,195	27.6	45	31	1,908	20.5	25	31	648	20.3	61
1000---	31	94			31	145	26.5	79	31	117			31	72			31	59			31	26			31	86		
950----	31	531	15.4	65	31	605	25.0	67	31	578	26.3	59	31	535			31	528			31	495			31	538		
900----	31	987	12.6	65	31	1,073	22.4	62	31	1,048	23.6	58	31	1,015	27.6	44	31	1,012			31	978			31	1,004	19.9	52
850----	31	1,464	9.2	66	31	1,568	18.9	67	31	1,545	20.4	62	31	1,519	24.5	43	31	1,517	25.6	44	31	1,475			31	1,494	16.8	51
800----	31	1,964	5.7	69	31	2,086	15.4	63	31	2,067	17.0	61	31	2,048	20.7	49	31	2,047	21.3	48	31	2,004	22.6	19	31	2,007	13.2	52
750----	31	2,494	2.6	64	31	2,638	12.2	58	31	2,619	13.1	62	31	2,606	16.3	53	31	2,605	16.6	55	31	2,564	18.5	20	31	2,565	9.4	51
700----	31	3,044	- .4	58	31	3,206	8.8	59	31	3,191	9.0	62	31	3,185	11.8	53	31	3,186	11.8	60	31	3,146	13.1	24	30	3,116	5.4	50
650----	31	3,638	- 3.2	48	31	3,821	5.2	58	31	3,808	5.1	58	31	3,804	7.1	54	31	3,805	6.8	65	31	3,764	7.3	30	30	3,722	1.1	51
600----	31	4,263	- 6.7	42	31	4,465	1.6	51	31	4,451	1.2	55	30	4,455	2.6	51	31	4,455	2.0	66	31	4,414	1.2	38	29	4,357	- 3.4	52
550----	31	4,940	-10.1	36	31	5,164	- 2.4	45	31	5,151	- 3.0	50	30	5,156	- 1.8	43	31	5,153	- 2.5	59	31	5,108	- 4.9	45	29	5,041	- 8.2	47
500----	31	5,667	-14.6	32	31	5,911	- 6.8	38	31	5,895	- 7.6	44	30	5,905	- 6.6	42	31	5,902	- 7.0	56	31	5,849	-10.8	46	29	5,773	-13.3	45
450----	31	6,467	-20.1	35	31	6,740	-11.6	35	31	6,719	-12.8	33	30	6,732	-11.9	34	31	6,729	-11.8	52	31	6,663	-15.8	34	29	6,575	-18.5	42
400----	31	7,319	-26.1	37	31	7,620	-17.4	34	31	7,596	-19.0		30	7,612	-17.8	35	31	7,610	-17.6	43	31	7,531	-21.7		29	7,436	-24.6	41
350----	31	8,271	-33.2		31	8,605	-24.6		30	8,574	-26.5		30	8,597	-24.6		30	8,597	-24.2	35	31	8,501	-28.9		29	8,392	-32.1	39
300----	31	9,335	-41.0		31	9,707	-33.1		30	9,669	-34.7		30	9,700	-32.8		30	9,701	-32.8		31	9,586	-37.0		29	9,460	-40.7	
250----	31	10,551	-48.8		30	10,961	-43.2		30	10,916	-44.2		29	10,955	-42.6		29	10,956	-42.9		31	10,822	-46.0		29	10,674	-50.0	
200----	31	12,002	-51.5		30	12,426	-54.4		30	12,377	-54.8		28	12,424	-53.7		29	12,421	-54.9		31	12,280	-53.9		28	12,102	-55.3	
175----	31	12,868	-51.9		30	13,269	-60.2		29	13,222	-60.0		27	13,269	-59.2		29	13,262	-60.9		30	13,128	-56.9		28	12,955	-54.2	
150----	31	13,863	-53.0		30	14,217	-65.2		29	14,173	-64.3		27	14,221	-64.4		28	14,204	-67.1		30	14,098	-59.8		28	13,943	-54.4	
125----	31	15,035	-54.0		29	15,319	-68.7		29	15,278	-67.2		25	15,322	-68.1		28	15,289	-71.5		30	15,230	-62.1		28	13,105	-56.3	
100----	31	16,465	-54.0		28	16,653	-68.3		26	16,619	-66.3		23	16,659	-68.1		25	16,608	-70.4		29	16,608	-62.7		26	16,515	-57.3	
80-----	31	17,899	-53.1		27	18,003	-64.4		22	17,979	-63.1		19	18,007	-63.5		22	17,949	-65.2		28	17,985	-60.5		25	17,930	-55.8	
60-----	27	19,758	-51.4		23	19,783	-59.5		20	19,770	-58.7		16	19,795	-58.3		20	19,730	-58.6		25	19,795	-56.3		23	19,768	-53.8	
50-----	26	20,944	-50.7		21	20,927	-57.8		20	20,923	-55.2		16	20,945	-56.2		20	20,879	-57.1		25	20,957	-55.0		21	20,937	-52.8	
40-----	24	22,399	-49.7		21	22,340	-55.6		20	22,351	-53.9		14	22,367	-53.7		19	22,296	-54.4		24	22,392	-52.6		16	22,380	-51.4	
30-----	23	24,281	-48.6		16	24,184	-53.0		19	24,214	-50.6		10	24,232	-51.3		9	24,154	-51.2		21	24,248	-50.7		10	24,246	-49.6	
20-----	12	26,968	-46.8						12	26,854	-46.9																	

Standard pressure surface (mb.)	GRAND JUNCTION, COLO. (852 MB.)				GREAT FALLS, MONT. (887 MB.)				GREEN BAY, WIS. (992 MB.)				GREENSBORO, N. C. (986 MB.)				HATTERAS, N. C. (1015 MB.)				HAVANA, CUBA (1011 MB.)				HILO, T. H. (1014 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,474	25.0	28	31	1,122	19.1	53	31	210	17.4	82	30	273	22.4	83	31	3	25.9	80	31	49	26.1	85	30	9	26.1	77
1000---	31	34			31	74			31	133			30	146			31	132	25.5	76	31	142	26.5	81	30	130	23.1	75
950----	31	506			31	534			31	578	18.5	64	30	600	24.4	61	31	585	23.3	70	31	597	24.4	77	30	379	19.9	79
900----	31	991			31	1,004			31	1,038	15.8	64	30	1,068	21.7	60	31	1,054	20.5	66	31	1,069	21.7	70	30	1,041	16.7	83
850----	31	1,490	25.4	28	31	1,489	18.0	44	31	1,521	12.7	62	30	1,562	18.3	64	31	1,547	17.4	64	31	1,563	18.8	66	30	1,326	13.6	86
800----	31	2,022	23.9	24	31	2,005	14.4	49	31	2,027	9.8	60	30	2,079	14.6	67	31	2,062	14.5	55	31	2,081	15.6	64	30	2,036	12.1	72
750----	31	2,586	19.2	27	31	2,554	10.3	54	31	2,568	7.3	51	30	2,629	11.2	65	31	2,610	11.4	53	31	2,626	12.6	57	30	2,587	10.9	47
700----	31	3,168	13.9	32	31	3,117	5.8	60	31	3,126	4.3	48	30	3,195	7.9	59	31	3,179	8.1	51	31	3,201	9.3	50	30	3,151	8.5	41
650----	31	3,790	8.2	39	31	3,724	1.1	65	31	3,728	1.1	41	30	3,812	4.5	53	31	3,792	4.7	47	31	3,814	5.6	48	30	3,766	5.3	33
600----	31	4,441	2.5	47	31	4,358	- 3.7	67	31	4,366	- 2.4	37	30	4,452	1.0	48	31	4,435	1.0	43	31	4,462	1.8	51	29	4,411	2.0	
550----	31	5,137	- 3.1	53	31	5,044	- 8.4	63	31	5,053	- 6.6	35	30	5,154	- 2.8	42	31	5,134	- 3.0	44	31	5,159	- 2.2	45	29	5,108	- 1.8	
500----	31	5,886	- 8.3	43	31	5,772	-13.6	59	31	5,790	-10.9	32	30	5,897	- 7.0	42	31	5,878	- 7.1	42	31	5,910	- 6.6	41	29	5,860	- 6.4	
450----	31	6,705	-13.9	37	31	6,575	-19.4	54	31	6,599	-16.3		30	6,726	-12.2	43	31	6,705	-12.1	39	31	6,737	-11.6	36	29	6,690	-11.7	
400----	31	7,579	-20.0		31	7,430	-25.7	49	31	7,468	-22.4		30	7,603	-18.2	40	31	7,583	-17.9	36	31	7,619	-17.4	37	29	7,568	-17.7	
350----	30	8,552	-27.2		31	8,382	-33.1	47	31	8,435	-29.3		30	8,586	-24.9	34	31	8,567	-25.2	37	31	8,607	-24.1	34	29	8,552	-25.2	
300----	30	9,643	-35.4		31	9,446	-41.3		31	9,516	-37.6		30	9,687	-33.2	34	31	9,668	-33.5	37	31	9,713	-32.4		29	9,650	-34.2	
250----	30	10,886	-44.3		31	10,658	-50.3		31	10,749	-46.4		30	10,942	-42.6		29	10,920	-43.3		29	10,972	-42.4		29	10,897	-44.5	
200----	30	12,351	-53.5		31	12,094	-55.3		31	12,206	-52.9		30	12,413	-53.4		29	12,386	-54.1		26	12,446	-53.9		29	12,351	-56.5	
175----	30	13,200	-58.0		31	12,946	-54.4		30	13,058	-55.8		30	13,261	-58.9		29	13,232	-59.5		23	13,293	-60.3		28	13,185	-63.0	
150----	30	14,160	-62.1		31	13,934	-54.4		30	14,033	-58.3		28	14,217	-63.3		28	14,183	-64.9		23	14,238	-66.9		28	14,118	-69.2	
125----	30	15,277	-65.4		31	15,097	-56.3		28	15,172	-60.1		28	15,328	-66.1		28	15,285	-67.9		22	15,327	-71.4		28	15,194	-72.5	
100----	25	16,625	-65.4		31	16,508	-57.7		28	16,562	-60.1		28	16,681	-65.3		25	16,624	-66.7		15	16,644	-70.9		28	16,500	-72.6	
80-----	23	17,993	-61.0		31	17,919	-56.3		27	17,955	-58.3		25	18,048	-62.5		25	17,983	-62.7		12	17,975	-68.2		27	17,819	-69.4	
60-----	21	19,799	-56.3		29	19,751	-54.5		26	19,777	-55.0		21	19,845	-57.2		24	19,780	-57.8		11	19,720	-61.8		26	19,559	-64.2	
50-----	20	20,959	-54.6		27	20,918	-53.4		26	20,947	-52.9		21	21,003	-55.1		22	20,931	-56.5		11	20,852	-59.4		22	20,682	-60.7	
40-----	20	22,395	-52.2		27	22,358	-51.7		26	22,393	-51.0		21	22,433	-53.3		19	22,358	-54.3		10	22,262	-56.8		21	22,073	-59.2	
30-----	11	24,262	-50.2		22	24,238	-48.9		19	24,287	-49.0		17	24,300	-50.5		11	24,216	-51.9						11	23,875	-56.8	
20-----					9	26,914	-45.7		5	26,937	-47.3		6	26,929	-47.8													

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

Standard pressure surface (mb.)	INTERNAT. FALLS, MINN. (973 MB.)				LAKE CHARLES, LA. (1016 MB.)				LANDER, WYO. (829 MB.)				LAS VEGAS, NEV. (933 MB.)				LITTLE ROCK, ARK. (1005 MB.)				MAZATLAN, MEXICO (1010 MB.)				MEDFORD, ORE. (967 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	360	15.6	80	31	5	26.1	83	29	1,696	22.0	27	31	660	32.7	14	31	79	29.3	57	12	14	29.1		31	401	22.3	46
1000	31	124			31	142	26.7	75	29	31			31	27			31	123	29.8	54	12	102	28.2		31	110		
950	31	563	17.3	70	31	597	25.0	68	29	497			31	499			31	590	29.6	48	12	568	25.1		31	562	21.4	45
900	31	1,023	14.3	69	31	1,069	22.6	60	29	978			31	983	32.1		31	1,063	26.2	50	12	1,032	22.6		31	1,022	17.8	51
850	31	1,503	11.0	70	31	1,564	19.7	56	29	1,479			31	1,492	27.5	17	31	1,565	22.1	57	12	1,528	19.6		31	1,508	14.0	57
800	31	2,006	8.4	62	31	2,084	16.8	51	29	2,008	22.4	20	31	2,023	22.6	19	31	2,089	17.9	62	12	2,049	17.0		31	2,016	10.2	62
750	31	2,543	5.6	58	31	2,634	13.5	51	29	2,564	17.3	23	31	2,585	17.4	24	31	2,644	14.0	57	12	2,603	13.9		31	2,558	7.0	57
700	30	3,101	2.5	54	31	3,209	10.0	45	29	3,146	12.0	27	31	3,162	12.0	29	31	3,216	10.2	53	12	3,177	10.6		31	3,115	3.8	46
650	30	3,698	- .5	48	30	3,819	6.2	44	29	3,761	6.4	34	31	3,782	6.7	35	31	3,837	6.4	51	11	3,795	6.4		31	3,715	.2	38
600	30	4,333	- 4.0	40	30	4,472	2.3	43	29	4,409	.7	39	31	4,429	2.3		31	4,482	2.5	49	10	4,448	2.4		31	4,349	- 3.9	33
550	29	5,013	- 8.1	38	30	5,173	- 1.8	41	25	5,096	- 5.0	42	31	5,126	- 2.5		30	5,188	- 1.2	38	9	5,158	- 1.7		31	5,030	- 8.5	32
500	29	5,747	-12.8		30	5,922	- 6.3	37	29	5,840	-10.9	42	30	5,875	- 7.6		30	5,934	- 5.8	36	8	5,900	- 6.3		31	5,762	-13.5	36
450	29	6,547	-18.3		29	6,749	-11.6	33	29	6,647	-16.8	35	29	6,697	-13.4		30	6,766	-11.1	33	8	6,730	-11.3		31	6,563	-19.2	35
400	29	7,410	-24.5		28	7,631	-17.5		29	7,514	-23.3		29	7,573	-19.7		30	7,647	-16.9		6	7,612	-16.2		31	7,420	-25.3	37
350	29	8,368	-31.9		26	8,615	-24.8		28	8,477	-30.4		29	8,549	-27.5		30	8,634	-24.1		6	8,602	-23.5		31	8,375	-32.6	
300	29	9,437	-40.1		24	9,715	-33.1		27	9,553	-39.0		28	9,638	-36.0		30	9,740	-32.6						31	9,443	-40.8	
250	29	10,656	-48.8		24	10,969	-43.0		26	10,774	-47.9		28	10,878	-45.4		28	11,000	-42.2						30	10,666	-48.4	
200	29	12,103	-53.2		23	12,431	-54.7		26	12,220	-54.6		28	12,334	-54.7		28	12,473	-53.4						30	12,119	-52.4	
175	29	12,961	-53.7		18	13,270	-60.8		25	13,073	-56.1		28	13,179	-59.0		28	13,320	-59.0						30	12,980	-53.1	
150	29	13,948	-55.1		16	14,220	-65.9		25	14,045	-58.9		26	14,137	-62.9		27	14,272	-64.7						30	13,971	-54.2	
125	29	15,108	-56.4		15	15,317	-69.5		24	15,179	-61.7		21	15,256	-65.9		27	15,372	-68.8						28	15,139	-55.7	
100	28	16,520	-57.2		11	16,645	-69.8		24	16,557	-62.0		8	16,590	-67.2		26	16,705	-68.5						24	16,555	-57.1	
80	28	17,930	-56.7		10	17,983	-67.4		23	17,938	-59.3						24	18,051	-64.8						20	17,963	-56.9	
60	24	19,767	-54.3		9	19,735	-62.3		21	19,760	-55.7						21	19,827	-58.8						17	19,792	-54.3	
50	24	20,939	-52.9		8	20,870	-58.5		21	20,925	-54.2						21	20,978	-56.3						16	20,967	-53.1	
40	23	22,385	-51.2		7	22,283	-55.8		15	22,345	-52.5						18	22,404	-53.6						15	22,410	-51.6	
30	21	24,262	-49.1						10	24,212	-50.2						13	24,250	-50.9						11	24,284	-49.5	
20	10	26,927	-46.4						5	26,842	-48.0																	
15	5	28,824	-45.4																									

Standard pressure surface (mb.)	MERIDA, MEXICO (1012 MB.)				MIAMI, FLA. (1016 MB.)				MIDLAND, TEX. (916 MB.)				NANTUCKET, MASS. (1013 MB.)				NASHVILLE, TENN. (996 MB.)				NORTH PLATTE, NEBR. (916 MB.)				OAKLAND, CALIF. (1014 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	27	26.9	82	31	4	27.9	76	31	871	28.0	49	31	14	18.0	90	31	177	26.8	67	31	848	22.4	76	31	6	15.5	78
1000	30	136	26.1	81	31	147	27.2	74	31	78			31	121	19.1	82	31	140			31	75			31	127	14.2	79
950	30	592	24.3	74	31	601	24.3	73	31	542			31	565	18.6	65	31	600	26.6	53	31	534			31	571	15.5	67
900	30	1,062	21.5	73	31	1,073	21.3	72	31	1,025	27.8	46	31	1,026	15.6	67	31	1,071	23.4	56	31	1,004	23.8	64	31	1,023	17.8	39
850	30	1,556	18.5	73	31	1,566	18.3	68	31	1,530	24.3	50	31	1,509	13.0	61	31	1,568	19.7	61	31	1,504	21.8	57	31	1,510	16.3	30
800	30	2,074	15.5	69	31	2,084	15.3	62	31	2,058	20.2	57	31	2,016	10.3	55	31	2,087	16.0	60	31	2,028	18.8	54	31	2,023	13.8	
750	30	2,617	12.4	63	31	2,630	12.1	58	31	2,613	15.9	62	31	2,557	7.4	56	31	2,638	12.3	61	31	2,584	15.2	51	31	2,572	11.0	
700	30	3,195	9.2	57	31	3,203	8.8	56	31	3,195	11.9	61	31	3,116	4.3	52	31	3,208	8.9	56	31	3,160	10.9	47	30	3,134	7.7	
650	29	3,806	5.7	54	31	3,814	5.1	56	31	3,814	7.6	59	31	3,718	1.1	46	31	3,825	5.0	56	31	3,777	6.6	42	30	3,741	4.1	
600	28	4,457	2.0	53	31	4,461	1.3	54	31	4,467	3.4	55	31	4,356	- 2.4	38	31	4,467	1.0	55	31	4,426	1.7	41	30	4,386	- .2	
550	28	5,154	- 1.9	50	31	5,160	- 2.9	50	31	5,174	- 1.0	51	31	5,045	- 5.8	32	31	5,166	- 2.7	47	31	5,121	- 3.3	41	30	5,077	- 4.8	
500	28	5,906	- 6.2	44	31	5,905	- 7.1	43	31	5,923	- 5.3	45	31	5,783	-10.4	32	31	5,912	- 6.8	41	31	5,868	- 8.5	41	30	5,818	-10.3	
450	28	6,730	-11.4	48	30	6,732	-12.1	38	30	6,762	-10.4	33	31	6,593	-15.8	36	31	6,738	-11.8	35	30	6,686	-13.9	41	30	6,629	-16.2	
400	28	7,617	-17.2	52	30	7,610	-18.0	40	30	7,641	-16.3	31	31	7,465	-21.4		31	7,619	-17.7	31	29	7,566	-19.8		30	7,496	-22.7	
350	27	8,604	-23.7	47	30	8,594	-24.8	38	29	8,631	-23.3	33	31	8,436	-28.4	37	31	8,605	-24.8		29	8,542	-27.0		30	8,460	-30.2	
300	26	9,710	-32.2		30	9,697	-33.1	37	28	9,740	-31.7		31	9,522	-36.3		30	9,709	-32.9		28	9,636	-35.1		30	9,539	-38.2	
250	25	10,969	-42.4		30	10,952	-43.0		28	11,001	-41.6		31	10,763	-44.8		30	10,965	-42.6		26	10,881	-44.6		29	10,773	-46.9	
200	22	12,434	-55.0		29	12,419	-54.5		27	12,475	-52.8		31	12,225	-53.2		29	12,436	-53.5		25	12,344	-54.3		29	12,225	-54.0	
175	20	13,277	-61.6		28	13,264	-60.3		26	13,325	-58.3		31	13,079	-56.2		29	13,284	-59.0		24	13,189	-59.1		28	13,076	-55.8	
150	19	14,213	-68.0		27	14,214	-66.0		26	14,282	-63.8		31	14,050	-58.8		29	14,238	-64.2		24	14,145	-63.3		28	14,050	-57.8	
125	13	15,300	-72.7		23	15,305	-70.6		21	15,388	-68.7		31	15,189	-60.7		29	15,345	-66.8		24	15,256	-66.4		27	15,194	-60.0	
100	9	16,608	-73.8		21	16,625	-70.6		20	16,715	-69.7		30	16,576	-60.2		27	16,691	-66.5		20	16,605	-66.8		27	16,577	-61.9	
80	5	17,911	-69.7		21	17,959	-66.7		19	18,057	-65.0		27	17,975	-57.7		26	18,051	-63.6		18	17,971	-62.0		27	17,961	-60.3	
60					21	19,719	-61.5		19	19,838	-58.5		23	19,802	-54.3		22	19,838	-57.4		18	19,765	-58.3		26	19,769	-56.8	
50					21	20,854	-59.1		17	20,989	-56.3		21	20,975	-52.8		22	20,994	-55.5		17	20,918	-56.1		22	20,925	-54.9	
40					18	22,262	-56.7		14	22,407	-54.7		20	22,420	-51.4		21	22,422	-53.5		13	22,336	-53.6		17	22,357	-53.1	
30					12	24,090	-53.6		11	24,257	-51.9		19	24,294	-49.6		17	24,288	-50.5		9	24,188	-51.1		12	24,219	-50.7	
20					7	26,705	-50.4		5	26,884	-48.6																	

Standard pressure surface (mb.)	OKLAHOMA CITY, OKLA. (969 MB.)				OMAHA, NEBR. (979 MB.)				PHOENIX, ARIZ. (970 MB.)				PITTSBURGH, PA. (976 MB.)				PORTLAND, ME. (1011 MB.)				RAPID CITY, S. DAK. (904 MB.)				ST. CLOUD, MINN. (978 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	391	28.7	52	31	300	24.2	78	31	341	34.1	36	31	375	20.0	77	31	20	16.0	85	31	966	21.9	55	31	316	18.5	80
1000	31	104			31	116			31	66			31	137			31	111	17.7	74	31	72			31	124		
950	31	568	29.7	44	31	570	23.6	72	31	533	33.2	34	31	584	19.7	72	31	554	17.0	62	31	531			31	575	20.0	67
900	31	1,047	27.3	44	31	1,038	21.6	68	31	1,018	29.4	36	31	1,047	17.2	73	31	1,009	13.8	66	31	1,004	22.4	52	31	1,033	16.7	68
850	31	1,549	23.4	48	31	1,533	19.5	61	31	1,524	25.1	40	31	1,533	14.2	72	31	1,489	10.7	66	31	1,500	21.1	50	31	1,518	13.7	64
800	31	2,075	19.4	52	31	2,053	16.8	56	31	2,052	20.5	47	31	2,043	11.0	69	31	1,991	8.0	60	31	2,022	17.5	50	31	2,027	11.5	51
750	31	2,626	15.2	54	31	2,605	13.3	55	31	2,607	15.7	52	31	2,587	8.4	64	31	2,529	5.5	52	31	2,577	13.5	51	31	2,570	8.5	48
700	31	3,207	11.2	51	31	3,177	9.3	58	31	3,186	10.9	56	31	3,147	5.4	58	31	3,083	2.7	43	31	3,147	9.7	48	31	3,131	5.4	47
650	30	3,822	7.1	45	31	3,793	5.0	58	31	3,808	6.6	53	31	3,754	2.2	53	31	3,682	- .6	43	31	3,763	5.2	45	31	3,739	2.0	40
600	30	4,474	2.8	43	31	4,437	.7	54	31	4,452	2.0	47	31	4,393	- 1.0	46	31	4,315	- 4.1	41	31	4,406	- .1	49	31	4,375	- 1.8	40
550	30	5,176	- 1.6	38	31	5,135	- 3.7	50	31	5,153	- 2.5	43	31	5,083	- 5.1	45	31	4,997	- 8.2	41	31	5,097	- 4.9	45	30	5,064	- 6.1	36
500	30	5,926	- 5.7	35	31	5,878	- 8.1	41	31	5,900	- 6.7		30	5,827	- 9.4	40	31	5,730	-13.1	36	31	5,838	-10.0	43	30	5,801	-11.0	35
450	30	6,759	-10.8	29	30	6,700	-13.2	39	31	6,728	-11.9		30	6,643	-14.7	40	30	6,533	-18.0	38	31	6,655	-15.4		30	6,611	-16.7	33
400	30	7,638	-17.1		30	7,575	-19.4	40	31	7,606	-17.9		29	7,520	-20.6		30	7,395	-24.2	41	31	7,522	-21.8		30	7,476	-22.9	
350	30	8,625	-24.1		30	8,554	-26.1		30	8,589	-25.4		29	8,493	-27.7		30	8,355	-31.1	41	31	8,491	-29.1		30	8,439	-30.2	
300	30	9,730	-32.4		30	9,650	-34.3		30	9,688	-33.6		29	9,581	-35.8		30	9,430	-38.5		31	9,573	-37.4		30	9,517	-38.3	
250	29	10,987	-42.4		27	10,904	-43.7		30	10,942	-43.0		27	10,821	-45.1		30	10,657	-46.8		31	10,806	-46.5		30	10,746	-46.7	
200	29	12,457	-53.5		27	12,371	-53.8		30	12,411	-53.9		27	12,279	-54.6		27	12,104	-52.7		30	12,259	-54.4		30	12,199	-53.7	
175	29	13,305	-59.1		26	13,219	-58.9		30	13,256	-59.6		27	13,124	-58.6		25	12,961	-54.3		29	13,103	-56.7		30	13,051	-56.3	
150	29	14,257	-64.6		26	14,175	-63.1		30	14,206	-65.3		27	14,083	-62.4		25	13,944	-55.8		29	14,073	-59.5		30	14,024	-58.3	
125	28	15,359	-68.3		24	15,285	-65.3		28	15,302	-69.1		26	15,199	-64.5		23	15,104	-57.2		26	15,209	-62.1		30	15,165	-59.8	
100	24	16,688	-69.0		23	16,637	-65.4		27	16,633	-68.8		20	16,556	-63.4		22	16,514	-58.0		25	16,585	-62.2		29	16,554	-60.1	
80	21	18,034	-64.0		21	18,009	-62.1		26	17,983	-64.0		9	17,939	-62.6		22	17,926	-55.6		23	17,970	-59.5		29	17,951	-58.0	
60	18	19,818	-58.3		20	19,803	-57.7		25	19,769	-58.5		5	19,742	-56.9		20	19,767	-53.1		22	19,785	-55.9		29	19,773	-55.3	
50	17	20,973	-56.0		16	20,963	-55.6		23	20,920	-56.2		5	20,897	-55.7		18	20,948	-51.8		22	20,948	-54.5		29	20,940	-53.7	
40	15	22,403	-53.9		13	22,388	-52.4		23	22,343	-54.4						16	22,393	-51.0		22	22,383	-52.4		26	22,382	-51.2	
30	13	24,260	-51.0		10	24,245	-50.3		20	24,188	-51.9						10	24,277	-49.0		19	24,253	-49.9		20	24,260	-49.3	
20									12	26,830	-48.9										5	26,931	-47.8					
15									6	28,716	-47.4																	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

Standard pressure surface (mb.)	SAN ANTONIO, TEX. (986 MB.)				SAN JUAN, P. R. (1014 MB.)				SANTA MARIA, CALIF. (1006 MB.)				S. STE. MARIE, MICH. (990 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	243	29.9	53	31	19	26.8	83	30	71	15.1	83	31	221	14.9	87
1000	31	119			31	143	26.0	81	30	126	14.4	83	31	133		
950	31	582	27.6	58	31	597	22.9	82	30	571	15.3	75	31	575	16.0	68
900	31	1,055	24.2	63	31	1,065	19.9	82	30	1,023	19.7	37	31	1,029	13.5	66
850	31	1,554	21.1	64	31	1,557	17.0	80	30	1,514	18.5	29	31	1,507	10.3	67
800	31	2,077	17.5	63	31	2,073	14.4	72	30	2,030	15.6	26	31	2,010	7.5	63
750	31	2,623	14.3	58	31	2,620	12.1	58	30	2,579	12.3	29	31	2,549	4.7	62
700	31	3,206	11.1	50	31	3,192	9.2	46	30	3,149	9.0		31	3,099	2.0	58
650	30	3,816	7.7	44	31	3,807	5.3	46	30	3,764	5.6		31	3,699	- 1.1	48
600	29	4,475	3.8	38	31	4,452	1.7	45	30	4,409	1.7		31	4,328	- 4.5	43
550	29	5,179	- .5	37	31	5,153	- 2.3	39	30	5,106	- 2.9		31	5,012	- 8.5	37
500	29	5,932	- 5.2	34	31	5,899	- 6.6	37	30	5,852	- 7.9		30	5,739	-13.3	37
450	29	6,765	-10.5	37	31	6,727	-11.9	37	30	6,672	-13.8		30	6,543	-18.7	38
400	28	7,648	-16.8	37	31	7,607	-17.4		30	7,547	-20.2		30	7,401	-25.0	36
350	28	8,637	-23.6		31	8,592	-24.7		29	8,519	-27.8		30	8,358	-32.0	
300	28	9,744	-32.2		31	9,694	-33.3		29	9,608	-36.3		30	9,429	-39.7	
250	27	11,004	-41.9		31	10,947	-43.6		29	10,847	-45.5		30	10,653	-47.6	
200	27	12,478	-53.4		31	12,410	-55.0		29	12,306	-53.9		26	12,105	-52.3	
175	25	13,323	-59.7		31	13,251	-61.1		29	13,155	-57.5		22	12,954	-52.6	
150	24	14,273	-65.4		31	14,193	-66.5		29	14,120	-61.2		21	13,950	-54.5	
125	22	15,369	-69.6		30	15,285	-70.9		29	15,242	-64.2		18	15,111	-56.7	
100	18	16,690	-70.9		28	16,598	-72.8		27	16,601	-65.2		10	16,529	-57.2	
80	17	18,026	-65.8		25	17,915	-69.9		26	17,970	-61.9		6	17,961	-55.8	
60	17	19,795	-60.2		24	19,657	-63.1		25	19,766	-58.1					
50	16	20,940	-57.3		24	20,786	-59.9		25	20,920	-55.8					
40	14	22,349	-54.8		22	22,188	-57.4		22	22,345	-53.9					
30	9	24,197	-52.0		19	24,017	-55.1		16	24,198	-51.3					
20																

Standard pressure surface (mb.)	SPOKANE, WASH. (930 MB.)				SWAN ISLAND, W. I. (1013 MB.)				TACUBAYA, MEXICO (775 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	722	20.5	41	31	10	27.3	83	30	2,306	16.4	71
1000	31	90			31	121	26.8	82	30	68		
950	31	539			31	578	23.6	80	30	532		
900	31	1,007	18.9	42	31	1,045	20.6	77	30	1,009		
850	31	1,495	14.9	45	31	1,537	17.7	73	30	1,504		
800	31	2,004	10.6	50	31	2,054	14.6	65	30	2,036		
750	31	2,543	6.2	56	31	2,602	12.0	55	30	2,585	14.6	68
700	31	3,100	2.2	56	31	3,173	8.9	47	30	3,162	10.3	71
650	31	3,695	- 1.6	53	31	3,791	5.3	48	30	3,779	5.6	78
600	31	4,328	- 5.8	51	31	4,433	1.5	46	30	4,426	1.1	80
550	31	5,003	-10.5	47	31	5,128	- 2.5	41	30	5,122	- 2.9	76
500	31	5,730	-15.7	46	31	5,880	- 7.0	39	30	5,871	- 7.4	68
450	31	6,523	-21.4	47	31	6,705	-11.7	35	30	6,695	-12.2	58
400	31	7,374	-27.4	45	31	7,588	-17.3	35	29	7,578	-17.6	50
350	31	8,320	-34.6	42	29	8,575	-24.1		25	8,561	-24.4	48
300	31	9,378	-42.4		29	9,681	-32.4		22	9,665	-32.9	43
250	31	10,588	-49.8		28	10,938	-42.3		19	10,922	-43.0	
200	30	12,039	-51.0		27	12,407	-54.1		15	12,382	-55.2	
175	29	12,907	-50.9		27	13,250	-60.6		15	13,222	-61.5	
150	29	13,909	-51.3		25	14,192	-67.1		12	14,161	-67.8	
125	27	15,090	-53.3		21	15,277	-71.5		9	15,242	-72.5	
100	17	16,533	-55.6		18	16,589	-71.7		7	16,545	-73.6	
80	15	17,959	-54.5		17	17,909	-68.8					
60	10	19,820	-52.4		16	19,657	-62.7					
50	8	20,992	-51.2		16	20,786	-59.1					
40	5	22,437	-50.3		12	22,210	-55.7					
30					9	24,038	-55.2					
20												

	TAMPA, FLA. (1016 MB.)				TATOOSH ISLAND, WASH. (1014 MB.)				VERACRUZ, MEXICO (1011 MB.)				WASHINGTON, D. C. (1006 MB.)			
SURFACE	30	7	26.0	87	31	31	12.4	95	29	13	28.6	77	31	88	21.9	75
1000	30	151	26.4	81	31	145	12.3	93	29	114	27.8	77	31	137	22.5	71
950	30	607	24.3	75	31	581	11.5	86	29	567	24.1	77	31	590	21.4	68
900	30	1,077	21.4	73	31	1,027	10.3	79	29	1,040	21.5	68	31	1,051	18.7	70
850	30	1,570	18.4	69	31	1,501	8.2	75	29	1,533	18.4	63	31	1,540	15.8	73
800	30	2,088	15.3	67	31	2,000	5.8	70	29	2,051	15.1	62	31	2,053	12.7	71
750	30	2,638	12.2	63	31	2,532	3.1	62	29	2,600	12.0	59	31	2,600	9.7	65
700	30	3,208	9.0	57	31	3,083	- .1	57	29	3,170	8.8	54	31	3,164	6.7	58
650	30	3,824	5.5	50	31	3,676	- 3.5	54	29	3,786	5.1	52	31	3,776	3.4	54
600	30	4,468	1.7	52	31	4,301	- 7.2	48	29	4,429	1.6	47	31	4,416	.2	43
550	30	5,171	- 2.4	48	31	4,976	-11.6	49	28	5,121	- 2.1	43	31	5,111	- 3.8	40
500	30	5,915	- 6.7	43	31	5,697	-16.7	41	28	5,877	- 6.2	39	31	5,854	- 8.2	40
450	30	6,742	-11.8	37	31	6,484	-22.6	39	28	6,704	-11.2	37	31	6,675	-13.4	41
400	30	7,623	-17.6	36	31	7,333	-29.1	38	28	7,590	-16.8	34	31	7,552	-19.4	37
350	30	8,608	-24.6	36	31	8,273	-36.0		28	8,579	-23.5		31	8,530	-26.5	37
300	29	9,710	-32.9	38	31	9,325	-43.8		28	9,686	-32.1		31	9,624	-34.7	
250	28	10,963	-42.8		31	10,531	-49.6		28	10,947	-42.1		31	10,872	-43.8	
200	28	12,431	-54.0		31	11,985	-50.3		28	12,417	-54.4		30	12,333	-53.6	
175	28	13,275	-59.7		31	12,857	-49.9		28	13,259	-60.9		29	13,178	-58.1	
150	26	14,225	-65.3		31	13,863	-50.6		28	14,202	-67.0		29	14,138	-61.7	
125	26	15,321	-69.9		31	15,047	-51.9		25	15,289	-71.9		29	15,260	-63.7	
100	25	16,642	-70.1		31	16,488	-53.0		20	16,599	-73.3		28	16,624	-63.0	
80	21	17,982	-66.2		30	17,928	-53.2		17	17,909	-69.3		26	18,003	-60.3	
60	19	19,745	-61.8		28	19,782	-52.6		8	19,634	-64.2		24	19,816	-55.6	
50	19	20,883	-59.4		27	20,961	-52.4		8	20,758	-60.5		22	20,979	-54.7	
40	18	22,281	-56.7		25	22,404	-51.3		7	22,153	-57.3		20	22,410	-52.6	
30	16	24,123	-53.7		20	24,280	-49.8						19	24,275	-50.1	
20	9	26,761	-49.4										8	26,946	-46.1	

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20 Air Force Data for April 1954, reprinted from the August 1954 issue with corrected Relative Humidity Data

Standard pressure surface (mb.)	DENVER, COLO. (831 MB.)				FT. WORTH, TEX. (995 MB.)				OGDEN, UTAH (854 MB.)				RANTOUL, ILL. (990 MB.)				ROME, N. Y. (1001 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	1,661	12.5	34	30	178	21.2	65	30	1,450	11.4	37	30	227	11.6	75	29	146	6.7	71
1000---	30	72			30	130	15.3		30	106			30	145			29	162	6.7	64
950----	30	522			30	579	19.8	62	30	550			30	580	11.8	68	29	584	6.0	67
900----	30	986			30	1,039	17.4	65	30	1,009			30	1,026	10.1	66	29	1,025	3.6	68
850----	30	1,470			30	1,525	14.8	64	30	1,489	12.0	33	30	1,500	8.6	61	29	1,487	1.7	68
800----	30	1,982	12.2	32	30	2,035	11.8	62	30	1,995	9.3	34	30	2,000	6.1	57	29	1,973	- .5	63
750----	30	2,519	8.5	33	30	2,580	9.4	46	30	2,527	5.0	38	29	2,532	3.5	52	29	2,491	- 2.8	57
700----	30	3,084	3.9	38	30	3,142	6.1	39	30	3,083	.4	43	29	3,081	.1	52	29	3,031	- 5.7	55
650----	30	3,681	- .9	41	30	3,748	2.1	34	30	3,671	- 4.5	50	29	3,674	- 3.8	49	28	3,607	- 9.2	52
600----	30	4,314	- 6.2	44	30	4,386	- 2.3	33	30	4,297	- 9.3	50	29	4,298	- 7.9	44	28	4,219	-12.8	50
550----	30	4,989	-11.8	48	30	5,069	- 7.3		30	4,963	-14.0	48	29	4,971	-12.4	39	28	4,877	-16.9	48
500----	30	5,710	-17.3	45	30	5,806	-12.5		30	5,680	-19.1	50	29	5,690	-17.3	39	28	5,586	-21.4	45
450----	30	6,494	-23.0	37	30	6,611	-18.2		30	6,457	-24.7	50	28	6,488	-22.6		28	6,355	-26.8	
400----	30	7,342	-29.5		30	7,471	-24.8		30	7,300	-30.9	52	28	7,331	-28.7		28	7,192	-33.2	
350----	30	8,280	-37.0		30	8,427	-32.0		30	8,233	-38.1		27	8,270	-35.8		28	8,116	-40.0	
300----	30	9,327	-45.1		30	9,497	-40.5		30	9,275	-46.3		26	9,322	-44.0		28	9,150	-47.4	
250----	30	10,519	-54.3		29	10,709	-50.3		30	10,459	-55.6		26	10,520	-53.2		28	10,333	-55.0	
200----	30	11,921	-62.0		27	12,132	-60.6		29	11,858	-61.1		23	11,923	-61.2		27	11,737	-60.9	
175----	27	12,745	-61.7		26	12,956	-63.2		27	12,686	-61.1		21	12,748	-63.7		26	12,555	-61.8	
150----	24	13,697	-61.0		22	13,894	-63.0		23	13,644	-60.3		17	13,689	-61.1		21	13,491	-59.1	
125----	17	14,824	-61.2		13	15,011	-64.9		21	14,779	-61.0		11	14,813	-60.7		17	14,641	-58.5	
100----	9	16,206	-61.6						12	16,158	-62.4		7	16,176	-62.4		14	16,050	-59.6	
80-----									5	17,519	-61.7						5	17,474	-59.3	

Note: All observations scheduled at 0300, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Table 21

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	180	2.3	31	221	1.4	28	272	2.6	29	276	2.7	30	330	2.0	31	119	3.6
500	--	---	----	--	---	----	--	---	----	--	---	----	--	---	----	31	119	4.3
1,000	31	185	3.3	--	---	----	--	---	----	29	291	3.1	30	320	1.6	24	144	3.5
1,500	29	201	3.6	--	---	----	28	275	4.7	27	300	4.2	30	275	.7	17	132	2.2
2,000	27	225	4.4	31	220	1.9	28	278	5.6	24	289	5.1	29	237	.9	13	129	2.1
2,500	25	248	4.8	31	246	2.2	28	280	7.4	20	292	6.1	29	267	3.4	10	68	2.5
3,000	23	270	5.8	30	275	4.2	26	271	9.0	19	286	6.5	29	272	4.9			
4,000	22	284	7.2	28	282	8.3	24	274	11.3	16	282	7.4	27	265	6.8			
5,000	21	302	9.5	28	282	10.2	21	282	13.7	14	287	8.8	25	276	9.0			
6,000	20	298	11.4	27	281	9.9	21	280	16.2	13	280	8.6	24	279	10.1			
8,000	17	303	16.0	24	285	11.1				10	277	10.8	17	299	12.8			
10,000	12	292	17.4	22	288	12.8							14	309	15.6			
12,000	10	292	24.1	18	284	16.4												
14,000																		
16,000																		

Altitude (meters) m.s.l.	• Buffalo, N. Y. (182 m.)			Burlington, Vt. (100 m.)			Charleston, S. C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)			Ely, Nev. (1,910 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	235	3.6	30	265	0.7	31	151	1.1	31	232	2.8	31	172	1.1	30	226	1.7
500	30	257	5.5	30	241	2.4	31	91	1.2	31	238	3.8	--	---	----	--	---	----
1,000	30	257	8.0	27	251	4.5	29	272	.5	30	246	4.7	--	---	----	--	---	----
1,500	29	261	9.0	19	252	6.1	28	297	3.0	27	252	5.2	31	190	1.5	--	---	----
2,000	29	267	9.5	17	270	9.2	28	296	2.9	22	266	6.1	31	213	1.2	30	234	2.1
2,500	29	273	10.5	16	274	11.0	26	284	2.7	19	265	7.4	31	250	2.0	30	233	2.1
3,000	29	274	11.8	12	273	12.4	25	273	3.6	16	274	7.2	31	270	3.0	29	215	3.2
4,000	27	270	14.6	11	282	14.9	20	258	3.6				27	285	5.2	28	243	4.9
5,000	26	264	16.8				18	257	3.7				27	280	6.1	25	253	7.7
6,000	26	267	19.0				16	251	6.1				28	275	6.8	24	259	9.0
8,000	23	266	20.5				11	177	2.1				27	275	7.3	20	245	8.7
10,000	19	279	23.0										22	281	11.6	14	244	5.5
12,000	18	286	26.0										21	277	14.3			
14,000	17	281	25.1										20	281	16.2			
16,000	13	283	20.0										10	290	9.6			

Altitude (meters) m.s.l.	Grand Junction, Colo. (1,475 m.)			Green Bay, Wis. (210 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Little Rock, Ark. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	316	1.3	27	266	2.4	31	263	1.7	30	268	3.6	30	62	3.4	31	207	0.9
500	--	---	----	27	276	3.4	31	258	1.8	--	---	----	30	62	3.2	31	216	1.0
1,000	--	---	----	22	279	4.5	31	255	2.2	30	267	5.1	30	60	2.2	30	243	1.6
1,500	31	319	1.3	20	280	6.3	31	269	3.1	28	268	7.4	29	31	1.0	25	266	3.1
2,000	31	287	.9	17	269	5.9	29	273	4.1	25	271	7.9	28	295	1.0	21	286	4.2
2,500	31	255	1.7	16	264	7.5	29	275	5.8	25	275	9.1	25	274	2.9	19	283	4.5
3,000	31	247	3.7	16	267	7.8	28	280	6.7	23	278	10.7	24	268	4.8	16	292	6.7
4,000	27	270	5.9	15	284	8.9	25	281	7.0	19	279	11.9	21	278	6.1	14	300	8.0
5,000	26	280	10.1	12	286	10.3	24	277	8.5	16	270	12.9	16	282	5.0	12	304	12.4
6,000	23	287	10.9	10	307	11.6	21	285	6.5	15	266	16.1	15	282	7.8			
8,000	22	294	13.8				18	284	7.1	10	273	17.1	15	271	11.7			
10,000	18	295	10.9				17	299	6.7				11	264	20.7			
12,000							14	281	8.7				10	268	20.5			
14,000																		
16,000																		

Altitude (meters) m.s.l.	Medford, Ore. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			% Oakland, Calif. (8 m.)			Omaha Nebr. (306 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	256	0.6	31	59	4.1	28	22	0.5	30	258	0.9	31	286	3.3	29	320	1.2
500	31	252	.6	31	58	5.5	27	35	.5	30	259	1.8	31	310	2.5	29	307	1.2
1,000	31	196	1.4	30	54	5.2	27	38	1.3	26	239	2.9	31	310	1.7	27	224	1.8
1,500	31	192	2.8	30	51	3.6	25	13	2.6	25	248	4.2	31	285	1.6	18	294	3.5
2,000	30	198	3.1	27	66	1.9	22	9	2.9	23	255	4.3	31	265	1.5	15	280	4.1
2,500	28	206	3.6	21	62	.6	22	341	2.5	21	270	6.1	31	276	1.7	15	278	6.5
3,000	27	256	3.5	21	245	.2	19	335	4.4	20	274	6.0	31	271	2.4	14	265	7.6
4,000	22	278	2.9	15	252	2.1	17	305	6.5	17	268	7.5	31	262	4.0	13	275	9.4
5,000	20	295	4.3	13	277	4.1	14	301	8.0	16	272	8.9	31	264	4.4	11	276	8.3
6,000	19	311	4.9	11	257	6.3	12	302	12.5	15	276	8.8	31	261	4.8	10	281	10.3
8,000	15	288	3.5							13	288	8.6	30	274	5.8			
10,000													27	276	6.5			
12,000													25	267	14.4			
14,000													23	253	14.8			
16,000													20	264	9.2			

Altitude (meters) m.s.l.	Phoenix, Ariz. (345 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	227	0.4	30	333	3.3	25	260	1.8	28	247	0.9	31	128	1.7	30	273	3.2
500	31	192	.5	--	---	----	25	250	2.2	28	267	1.8	31	115	1.9	30	295	3.0
1,000	31	181	.8	30	332	3.5	24	251	3.3	27	255	3.9	30	121	2.5	26	317	.6
1,500	31	199	1.5	30	321	4.7	22	260	4.8	23	251	6.4	29	152	2.1	26	163	.3
2,000	31	215	2.4	27	309	5.5	20	272	6.5	21	266	7.1	26	196	2.7	26	236	.6
2,500	31	214	3.2	23	304	6.9	19	280	7.8	19	277	7.0	23	232	2.8	25	267	1.6
3,000	30	220	4.3	22	299	9.3	14	272	8.3	16	285	5.5	22	258	3.2	25	245	2.9
4,000	29	243	5.4	15	299	11.7	13	276	10.5	10	299	6.0	19	281	7.7	25	238	4.6
5,000	28	243	6.3	14	290	12.1	10	297	9.7	10	294	6.5	17	289	9.0	25	244	6.2
6,000	27	251	7.5	12	288	12.7							14	292	9.8	25	240	8.7
8,000	21	252	9.4													19	252	10.3
10,000	19	263	11.6													15	265	12.0
12,000	12	259	11.1													12	264	8.9
14,000																		
16,000																		

Altitude (meters) m.s.l.	•• Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (725 m.)			# Washington, D. C. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	285	2.3	30	218	1.6	30	255	0.9
500	31	278	3.1	--	---	----	30	264	2.9
1,000	31	276	5.2	30	212	2.2	30	268	4.4
1,500	31	280	6.5	29	218	3.0	30	275	6.3
2,000	31	280	8.6	28	234	4.1	30	274	7.3
2,500	31	279	10.6	27	248	4.8	30	276	8.7
3,000	31	280	11.5	26	268	5.2	30	271	10.2
4,000	30	281	14.0	22	291	8.6	30	266	12.3
5,000	30	277	16.2	20	289	10.6	30	261	14.2
6,000	30	280	19.5	18	302	12.6	30	257	16.2
8,000	30	275	23.2	13	309	18.4	30	256	15.3
10,000	25	274	30.0				30	256	17.6
12,000	21	270	31.7				29	263	20.6
14,000	14	268	19.5				29	268	17.1
16,000	12	270	14.3				23	260	15.5

•• Rawin Data

• Rawin Data (Cont'd.)
18,000 m., 13 obs. 287 dir., 14.4 speed
20,000 m., 12 obs. 283 dir., 7.4 speed
22,000 m., 12 obs. 285 dir., 6.8 speed

% Rawin Data (Cont'd.)
18,000 m., 18 obs. 271 dir., 2.7 speed
20,000 m., 14 obs. 295 dir., 3.2 speed
22,000 m., 10 obs. 353 dir., 4.7 speed

Rawin Data (Cont'd.)
16,000 m., 21 obs. 279 dir., 9.1 speed
20,000 m., 16 obs. 303 dir., 3.9 speed

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

RAWIN DATA

Average monthly resultant winds

Table 22

OCTOBER 1954

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Buffalo, N.Y. (182 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	120	2.8	31	48	0.4	31	100	2.2	30	213	1.8
500	--	---	----	--	---	----	31	114	6.4	30	254	5.2
1,000	--	---	----	31	302	3.2	30	116	6.3	30	265	7.5
1,500	--	---	----	31	306	5.1	29	133	4.2	30	265	8.6
2,000	31	204	2.7	30	299	6.7	29	128	3.3	29	268	9.2
2,500	31	240	3.4	30	285	7.3	28	116	2.0	29	273	9.8
3,000	31	268	4.2	30	285	8.3	27	69	1.3	28	277	11.2
4,000	31	272	7.3	29	283	10.8	24	24	1.2	27	277	13.4
5,000	30	281	7.6	27	279	12.7	21	2	1.2	26	269	15.9
6,000	30	274	9.1	23	272	12.6	14	309	2.0	25	267	19.5
8,000	29	275	10.9	18	259	13.6				24	261	23.4
10,000	21	268	8.0	16	262	16.0				21	266	26.3
12,000	14	286	9.8	13	260	17.5				18	270	30.8
14,000										14	272	28.1
16,000												
18,000												
20,000												
22,000												
24,000												

Altitude (meters) m.s.l.	Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S. C. (13 m.)			Columbia, Mo. (237 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	69	3.7	31	279	1.5	31	6	0.4	30	137	1.2
500	30	68	4.5	31	284	3.2	30	167	.6	30	181	1.8
1,000	29	86	4.3	31	291	6.1	30	281	.4	30	242	4.0
1,500	29	76	3.8	31	285	7.9	30	260	.4	30	262	5.9
2,000	26	61	3.2	30	279	8.9	30	252	1.0	30	268	7.4
2,500	26	39	2.6	29	271	9.9	30	266	1.6	30	270	8.1
3,000	25	36	2.0	27	277	11.4	29	253	2.7	30	274	8.7
4,000	26	319	.6	26	272	14.3	29	255	3.4	30	280	9.7
5,000	23	299	2.4	24	268	16.6	30	263	4.7	30	273	11.0
6,000	23	280	3.2	20	272	20.2	28	280	3.7	30	280	13.3
8,000	22	288	4.7	11	270	24.1	25	300	5.2	30	275	15.3
10,000	22	308	4.8				23	303	7.8	29	274	18.7
12,000	18	307	6.8				22	282	7.0	27	276	21.1
14,000	13	301	8.4				21	275	6.0	25	278	19.3
16,000							18	288	3.7	23	281	12.6
18,000							13	256	1.2	21	294	7.3
20,000							13	138	1.1	16	291	3.0
22,000							12	89	2.0	14	304	4.3
24,000												

Altitude (meters) m.s.l.	Grand Junction, Colo. (1,473 m.)			Greensboro, N.C. (275 m.)			Hatteras, N. C. (3 m.)			Int. Falls, Minn. (358 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	66	1.4	31	123	0.1	30	256	0.7	30	232	1.0
500	--	---	----	31	232	1.1	29	235	.7	29	243	2.2
1,000	--	---	----	31	257	2.0	29	207	1.0	28	277	5.8
1,500	30	72	1.3	31	271	2.2	29	199	.7	28	295	5.0
2,000	30	238	1.0	31	262	3.3	30	260	1.6	27	297	5.7
2,500	30	229	3.3	31	260	4.8	30	246	2.8	27	289	6.2
3,000	30	235	5.0	31	256	6.0	28	259	2.7	29	287	8.5
4,000	31	258	6.9	30	259	6.6	27	261	5.7	25	283	12.0
5,000	31	270	9.7	28	261	8.0	25	272	6.3	25	291	16.5
6,000	26	273	11.8	28	259	8.3	23	274	4.7	23	287	18.7
8,000	21	286	11.1	21	273	8.6	22	294	5.6	24	287	23.2
10,000	16	291	12.5	17	272	11.6	23	270	6.5	22	284	25.5
12,000	10	275	10.2	12	265	9.7	21	297	9.3	20	285	20.1
14,000							20	298	10.3	15	282	16.0
16,000							19	297	6.6	14	285	10.1
18,000							18	297	3.8	14	295	9.8
20,000							16	313	3.0	13	312	8.3
22,000							13	350	1.2	10	310	5.9
24,000							11	110	4.8			

Altitude (meters) m.s.l.	Little Rock, Ark. (80 m.)			Medford, Ore. (401 m.)			Miami, Fla. (12 m.)			Midland, Tex. (871 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	84	0.4	31	150	0.8	31	48	2.5	31	131	2.1
500	31	170	2.3	31	142	.7	31	71	6.7	--	---	----
1,000	31	216	3.1	31	182	.8	31	79	6.5	31	141	3.1
1,500	30	244	3.3	31	184	2.3	31	90	4.4	31	156	4.5
2,000	30	259	3.7	31	200	3.2	31	101	3.3	31	187	3.2
2,500	28	284	5.2	31	231	4.5	31	113	2.0	31	235	2.7
3,000	26	291	5.9	31	248	5.8	31	92	.9	31	255	3.6
4,000	25	289	7.2	31	264	7.6	31	336	.8	30	277	4.5
5,000	23	301	6.9	31	269	9.8	31	296	2.4	29	290	5.8
6,000	18	309	5.0	26	275	11.1	29	287	2.5	29	289	6.9
8,000	18	286	7.2	22	280	10.4	28	269	6.0	29	283	7.8
10,000	16	286	9.3	16	313	6.8	28	268	12.0	27	283	10.8
12,000	13	306	7.0	14	280	6.8	27	257	15.7	23	287	9.8
14,000	11	318	6.8	11	270	10.6	23	253	9.5	21	295	8.8
16,000	10	353	4.7	10	256	9.5	20	81	1.1	18	285	6.5
18,000				10	265	6.5	14	82	5.2	17	303	2.9
20,000							13	84	6.6	14	76	4.5
22,000										14	77	3.1
24,000										13	89	4.9

Altitude (meters) m.s.l.	Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	241	2.8	31	290	0.4	31	295	1.4	31	149	2.9
500	31	265	7.0	29	219	.9	31	309	2.7	31	149	4.1
1,000	31	274	7.2	29	230	2.3	31	307	2.1	29	178	5.2
1,500	31	271	7.3	30	256	4.2	31	324	1.0	29	213	5.4
2,000	31	270	7.9	30	265	5.2	31	311	1.1	30	236	6.1
2,500	31	263	9.7	30	274	5.9	31	298	1.8	30	257	6.0
3,000	31	258	11.1	30	280	6.8	31	288	2.7	31	263	6.6
4,000	28	257	12.8	31	280	9.6	30	278	3.6	31	285	6.7
5,000	26	266	15.2	31	279	9.9	30	266	4.8	30	274	9.4
6,000	22	271	15.8	28	279	10.4	30	266	6.1	28	267	9.8
8,000	15	265	16.0	25	270	9.0	30	265	7.8	28	265	11.2
10,000	11	281	19.2	23	267	6.9	29	287	9.0	25	259	11.3
12,000				22	283	9.8	28	258	12.8	23	279	11.6
14,000				18	280	7.7	25	249	14.5	23	287	13.0
16,000				16	280	6.2				24	287	6.8
18,000				11	308	5.3				18	276	4.0
20,000										18	47	.8
22,000										18	114	2.3
24,000										10	29	3.2

Altitude (meters) m.s.l.	Rapid City, S. Dak. (980 m.)			St. Cloud, Minn. (318 m.)			San Antonio, Tex. (242 m)			San Juan, P. R. (28 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	313	1.8	31	230	0.5	31	122	2.0	31	137	2.6
500	--	---	----	31	219	1.4	31	125	5.7	31	112	6.7
1,000	31	309	2.0	30	259	2.4	31	133	5.1	31	114	7.6
1,500	31	310	3.0	30	276	3.4	31	143	2.8	31	109	6.9
2,000	31	306	4.3	30	277	5.5	31	174	1.5	31	103	5.6
2,500	31	289	5.2	30	282	6.8	31	207	1.3	31	96	5.3
3,000	31	287	7.8	29	287	7.6	31	246	2.0	31	100	4.2
4,000	30	275	11.0	29	283	10.4	31	273	2.9	30	115	2.5
5,000	28	281	12.4	27	280	12.0	31	283	4.3	28	114	3.4
6,000	23	275	12.2	26	278	12.8	31	280	6.2	28	102	2.8
8,000	18	262	13.9	22	277	13.2	31	293	8.1	29	296	.8
10,000	13	251	19.6	19	272	17.0	27	273	10.1	29	279	4.8
12,000				14	285	16.7	22	287	12.3	29	294	7.3
14,000				13	294	10.9	18	304	7.8	29	309	9.7
16,000				13	288	10.0	17	307	2.1	26	342	2.6
18,000				12	298	6.7				21	91	4.8
20,000				13	321	3.7				17	83	11.1
22,000										16	94	13.9
24,000										12	90	15.1

Altitude (meters) m.s.l.	Santa Maria, Calif. (72 m.)			Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is., Wash. (33 m.)			Washington, D. C. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	266	0.9	31	313	1.2	31	199	0.9	31	111	3.9	31	223	1.1
500	31	11	3.4	31	297	2.1	--	---	----	30	155	3.9	31	258	4.5
1,000	31	18	3.5	31	288	4.0	31	198	1.5	30	177	5.0	31	268	5.9
1,500	31	32	2.7	31	278	6.2	31	229	3.3	29	193	4.7	31	269	6.2
2,000	31	15	1.5	31	277	7.4	31	243	4.5	28	224	5.2	31	270	6.2
2,500	31	343	2.0	31	279	8.6	31	245	6.1	29	243	7.0	31	271	7.3
3,000	31	309	2.2	31	274	10.3	31	254	7.1	28	249	6.8	31	265	8.0
4,000	31	277	4.0	31	274	13.3	31	264	8.8	27	256	9.0	30	262	9.5
5,000	31	261	5.3	30	272	16.2	31	272	12.4	24	275	11.4	30	257	11.6
6,000	31	253	6.7	29	271	19.3	31	271	13.9	22	273	11.6	30	251	14.1
8,000	30	257	8.5	27	264	25.2	29	284	19.3	19	281	20.6	30	243	14.6
10,000	28	256	11.3	21	268	35.7	24	299	18.0	17	300	23.8	30	246	15.7
12,000	27	255	13.3	14	269	38.9	23	287	20.7	12	282	18.9	29	253	17.8
14,000	23	255	9.6				21	282	20.1	13	287	16.8	26	266	17.5
16,000	22	266	6.6							14	288	14.6	25	270	13.3
18,000	21	282	2.9							14	281	12.0	21	277	6.0
20,000	19	18	4.4							13	293	8.8	19	262	5.4
22,000	15	61	5.1							11	318	7.8	14	259	4.7
24,000													10	244	5.2

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following Table 22 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

RAWIN DATA

Average monthly resultant winds

Table 22 *Air Force Data for June 1954

Altitude (meters) m.s.l.	Denver, Colo. (1,661 m.)			Ft. Worth, Tex. (178 m.)			Ogden Utah (1,450 m.)			Rantoul, Ill. (227 m.)			Rome, N. Y. (146 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	70	0.8	30	135	2.6	29	57	1.3	29	172	0.6	30	18	0.3
500	--	---	----	30	153	8.8	--	---	----	28	195	2.8	30	270	1.3
1,000	--	---	----	30	165	10.0	--	---	----	28	228	5.2	30	277	4.8
1,500	--	---	----	30	173	8.4	29	55	1.1	27	249	5.6	30	288	5.9
2,000	30	160	.8	30	189	6.7	29	225	2.5	27	267	6.1	30	295	6.6
2,500	29	201	1.8	30	205	4.6	28	225	4.2	27	275	6.6	30	296	7.2
3,000	29	222	3.5	30	216	3.9	28	238	6.1	27	280	7.1	30	301	7.9
4,000	30	228	6.4	30	257	2.7	28	244	9.7	28	285	7.8	28	310	9.4
5,000	30	239	8.7	30	248	2.4	28	248	12.1	28	295	9.8	28	312	10.4
6,000	30	247	11.3	30	267	3.2	29	248	14.0	29	287	11.2	28	314	12.9
8,000	29	255	13.9	30	281	5.2	28	253	16.6	29	289	12.1	28	322	15.0
10,000	28	253	16.1	29	279	6.3	27	251	21.6	29	275	13.2	27	314	19.1
12,000	23	250	16.5	24	270	10.2	25	247	22.0	28	274	15.0	26	312	21.7
14,000	21	245	15.0	23	275	11.3	22	250	14.8	26	273	14.4	25	310	19.5
16,000	16	221	8.3	12	238	4.9	17	226	10.8	17	306	7.8	20	323	9.0
18,000	10	181	1.3				10	209	.8				18	356	3.9
20,000	10	91	4.4										15	53	3.2
22,000													14	84	6.6

* July data for the above Air Force stations will be included in the November issue of this publication.

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (n = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following Table 22 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun. OCTOBER 1954

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
ALBUQUERQUE, N. MEX.									
	Air mass								
	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0
Oct.									
1	0.86	0.98	1.09	1.24	----	1.21	1.04	----	----
3	.64	.79	----	----	----	1.05	----	----	0.61
4	----	----	----	1.15	----	1.14	----	----	----
10	.87	1.00	1.10	1.26	----	----	1.13	1.05	.95
11	.92	1.05	1.14	1.32	----	1.33	1.19	1.08	.99
12	.94	1.06	1.15	1.29	----	1.30	1.15	1.06	.93
13	.99	1.07	1.17	1.32	----	1.26	1.05	.93	.77
14	.98	1.09	1.18	1.33	----	1.30	1.17	1.07	.94
15	1.00	1.11	1.20	1.33	----	1.27	1.15	1.04	.94
16	.92	1.04	1.14	1.30	----	1.33	1.19	1.10	.96
17	.94	1.07	1.17	1.32	----	1.34	1.19	1.09	.98
18	----	----	----	----	----	1.34	1.21	1.10	.99
19	.97	1.08	1.19	1.34	----	1.31	1.16	----	.96
20	----	----	----	----	----	1.33	1.12	----	----
21	.94	1.07	1.18	1.32	----	1.26	1.11	1.04	.91
22	.89	1.01	1.11	1.27	----	1.27	1.11	.98	.87
23	.75	.88	.99	1.22	----	1.21	----	.93	.79
24	.81	.94	1.09	1.27	----	.91	.72	.65	.49
25	.51	.72	.89	1.12	----	1.19	----	----	----
26	.78	.92	1.05	1.22	----	1.30	1.17	1.05	.96
27	----	----	1.05	----	----	1.14	1.01	.82	.70
28	.93	1.06	1.16	1.25	----	1.26	----	----	----
29	.94	1.05	1.15	1.27	----	----	----	----	----
30	.99	1.10	1.22	1.28	----	1.20	.92	1.01	.90
31	.92	1.03	1.18	1.30	----	1.37	1.21	1.10	.99
Averages	.88	1.01	1.12	1.27	----	1.24	1.11	1.01	.88
Departures	-.04	-.02	-.04	-.03	----	-.07	-.06	-.05	-.05
LINCOLN, NEBR.									
	Air mass								
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77
Oct.									
9	0.62	0.71	0.86	----	----	----	----	----	----
12	----	----	----	----	1.32	1.19	0.99	0.82	0.71
15	----	.88	1.07	1.22	1.36	1.22	1.03	.90	.81
16	.85	.94	1.07	1.22	1.36	1.22	1.07	.92	----
18	.77	.86	1.03	1.20	1.33	----	----	----	----
23	.66	.77	.92	1.14	1.28	1.12	.90	.73	.60
27	----	----	1.09	1.27	1.39	1.27	1.14	1.01	.90
20	.85	.94	1.07	1.24	1.37	----	----	----	----
Averages	.75	.85	1.02	1.22	1.34	1.20	1.05	.88	.75
Departures	-.03	-.04	-.03	-.01	-.07	-.01	.02	-.02	-.04
BLUE HILL, MASS.									
	Air mass								
	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86
Oct.									
5	0.88	----	----	----	----	----	----	----	----
7	----	----	----	1.35	----	1.35	1.22	1.12	----
8	.97	1.09	1.21	1.35	----	1.26	1.11	.95	----
12	----	----	----	----	----	1.10	.86	----	----
13	----	----	----	1.08	----	----	----	----	----
14	----	.79	.93	1.03	----	----	----	----	----
18	.90	1.00	1.14	1.30	----	1.26	1.07	.94	.71
19	----	----	.98	1.16	----	1.15	1.00	.89	.78
21	----	----	----	----	----	----	----	1.01	.87
22	.98	1.08	1.14	----	----	----	----	----	----
24	.86	.96	1.10	1.28	----	1.31	1.20	1.12	1.02
25	.99	1.08	1.20	1.33	----	1.30	1.08	.90	.82
28	1.05	1.13	1.26	1.39	----	1.35	1.18	1.06	.97
Averages	.94	1.02	1.12	1.25	----	1.26	1.09	1.00	.86
Departures	.09	.07	.04	.03	----	.06	.07	.14	.09

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
MADISON, WIS.									
	Air mass								
	4.81	3.84	2.88	1.92	*1.0	1.92	2.88	3.84	4.81
Oct.									
6	----	----	----	1.29	----	1.28	1.11	0.94	0.81
7	----	1.06	1.18	1.34	----	----	----	----	----
12	----	----	----	----	----	----	1.11	.98	.86
18	0.99	1.08	1.22	1.38	----	1.37	1.20	1.07	.95
20	----	----	----	----	----	1.26	1.00	.84	.74
21#	.65	.79	.96	1.22	----	1.18	.86	.70	.54
22	.80	.91	1.03	1.20	----	1.19	.96	.84	.74
23	.84	.95	1.09	1.28	----	1.21	.98	.83	.70
27	----	----	----	----	----	1.36	1.19	1.06	.96
29#	.79	.89	1.00	1.15	----	1.15	.96	.82	.70
30	.97	----	----	----	----	----	----	----	----
31	.85	.99	1.14	1.34	----	----	----	----	----
Averages	.86	.94	1.10	1.28	----	1.25	1.04	.90	.78
Departures	.13	.08	.10	.11	----	.06	.02	----	----
TABLE MOUNTAIN, CALIF.									
	Air mass								
	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76
Oct.									
2	----	----	----	1.48	----	----	----	----	----
3	----	1.16	1.24	1.36	----	----	----	----	----
4	----	----	----	1.48	----	----	----	----	----
5	----	1.21	1.30	1.41	----	----	----	----	----
6	----	1.22	1.32	1.45	----	----	----	----	----
7	----	----	----	1.48	----	----	----	----	----
9	----	----	----	1.42	----	----	----	----	----
10	----	----	----	1.43	----	----	----	----	----
11	----	1.17	1.28	1.40	----	----	----	----	----
12	----	1.18	1.29	1.42	----	----	----	----	----
13	----	----	----	1.48	----	----	----	----	----
14	----	----	----	1.40	----	----	----	----	----
15	----	1.21	1.30	1.44	----	----	----	----	----
16	----	----	----	1.46	----	----	----	----	----
18	----	1.21	1.32	1.44	----	----	----	----	----
20	----	----	----	1.44	----	----	----	----	----
21	----	----	----	1.43	----	----	----	----	----
28	----	----	----	1.46	----	----	----	----	----
29	----	----	----	1.45	----	----	----	----	----
30	----	----	----	1.47	----	----	----	----	----
31	----	1.26	1.36	1.48	----	----	----	----	----
Averages	----	1.20	1.30	1.44	----	----	----	----	----
Departures	----	-.04	-.04	-.03	----	----	----	----	----
WASHINGTON, D. C. (WBCO)									
	Air mass								
	4.95	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.95
Oct.									
11	----	----	0.97	1.16	----	1.16	----	----	----
12	----	----	----	1.18	----	1.18	1.03	0.88	----
13	----	0.70	.89	1.10	----	.90	.84	----	----
18	----	----	1.06	1.18	----	----	----	----	----
20	0.94	1.03	1.15	1.29	----	----	----	----	----
22	.74	.86	.97	1.21	----	1.21	----	.91	0.78
28	----	.96	1.13	1.29	----	1.21	----	----	----
Averages	.84	.89	1.20	1.20	----	1.13	.94	.90	.78

* Extrapolated
# Haze

Langley is the unit used to denote one gram calorie per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on pages 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

SOLAR RADIATION DATA

OCTOBER 1954

Table 31a Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date-----------	1	2	3	4	5	6	7		8	9	10	11	12	13	14		15	16	17	18	19	20	21	
Langleys-------	86	72	79	63	67	30	65	66	65	82	32	70	65	56	64	62	65	50	62	60	61	69	64	62
Date-----------	22	23	24	25	26	27	28		29	30	31	1	2	3	4									
Langleys-------	61	62	55	56	59	35	63	56	27	18	66	60	61	18	56	44								

Table 31b Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date-----------	1	2	3	4	5	6	7		8	9	10	11	12	13	14		15	16	17	18	19	20	21	
Langleys-------	79	243	107	71	269	29	315	159	307	245	36	113	206	280	243	190	106	76	182	258	242	104	74	149
Date-----------	22	23	24	25	26	27	28		29	30	31	1	2	3	4									
Langleys-------	251	220	238	242	175	39	254	203	35	25	71	206	118	22	110	84								

Table 31c Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date-----------	1	2	3	4	5	6	7		8	9	10	11	12	13	14		15	16	17	18	19	20	21	
Langleys-------	209	350	148	98	436	64	529	262	522	215	36	305	440	372	378	324	142	104	430	536	510	216	189	311
Date-----------	22	23	24	25	26	27	28		29	30	31	1	2	3	4									
Langleys-------	466	438	535	524	174	44	556	394	24	18	118	335	134	22	258	130								

Table 31d Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date-----------	1	2	3	4	5	6	7		8	9	10	11	12	13	14		15	16	17	18	19	20	21	
Langleys-------	248	197	105	110	214	133	304	187	309	131	38	185	233	192	183	181	116	74	286	266	272	175	202	198
Date-----------	22	23	24	25	26	27	28		29	30	31	1	2	3	4									
Langleys-------	278	258	273	250	75	42	272	207	25	25	123	153	76	31	115	77								

Table 31e Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date-----------	1	2	3	4	5	6	7		8	9	10	11	12	13	14		15	16	17	18	19	20	21	
Langleys-------	111	139	152	116	82	37	41	97	48	159	53	109	68	77	111	89	131	107	107	45	56	157	124	104
Date-----------	22	23	24	25	26	27	28		29	30	31	1	2	3	4									
Langleys-------	77	87	54	35	95	42	22	60	21	13	116	77	115	17	106	66								

Note: Langley is the unit used to denote one gram calorie per square centimeter

SOLAR RADIATION DATA

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys. OCTOBER 1954

	Aklavik, MacKenzie	Albrook Air Base Panama, C. Z.	Albuquerque, N.Mex.	Annette, Alaska	Astoria, Ore.	Atlanta, Ga.	Barrow, Alaska	Bethel, Alaska	Bismarck, N. Dak.	Blue Bill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Tex.	Canton Island, Pacific Area	Caribou, Me.	Charleston, S. C.	Columbia, Mo.	Dodge City, Kans.
1954																		
Oct. 1------	30	327	560	117	397	448	76	258	275	211	436	211	541	674	293	502	371	453
Oct. 2------	150	228	495	372	207	479	99	149	397	309	428	271	518	622	54	(503)	334	441
Oct. 3------	166	223	503	369	294	325	86	231	320	191	420	203	523	712	87	278	461	458
Oct. 4------	61	227	521	414	290	430	---	239	135	131	430	109	263	691	56	402	87	332
Oct. 5------	(65)	456	453	291	215	442	40	53	243	361	392	290	156	662	376	348	285	263
Oct. 6------	78	535	181	295	119	437	45	97	421	62	408	60	103	728	249	455	152	63
Oct. 7------	71	598	398	181	90	119	38	96	306	417	363	357	(423)	686	340	54	402	80
Averages------	(89)	371	444	291	230	383	64	160	300	240	411	214	(361)	682	208	(363)	299	298
Departures----	---	---	---	---	---	---	---	---	---	-63	---	---	---	---	---	---	---	---
Oct. 8------	72	446	392	41	227	149	52	75	381	392	224	329	360	---	252	406	431	445
Oct. 9------	44	289	444	29	157	444	39	101	236	219	304	182	327	719	234	464	421	449
Oct. 10------	35	499	531	117	108	472	23	81	129	62	401	84	323	734	209	385	364	368
Oct. 11------	45	524	544	90	260	426	36	75	264	260	---	195	465	710	15	500	10	277
Oct. 12------	116	329	527	166	222	254	(39)	74	381	322	---	280	448	675	55	496	375	475
Oct. 13------	53	495	521	78	256	411	32	177	223	263	390	253	487	664	206	422	402	(476)
Oct. 14------	58	421	534	186	328	367	66	154	227	279	388	217	434	658	343	163	134	469
Averages------	60	429	499	101	223	360	(41)	105	263	257	341	220	407	693	188	405	305	(423)
Departures----	---	---	---	---	---	---	---	---	---	-48	---	---	---	---	---	---	---	---
Oct. 15------	38	496	522	46	285	470	26	92	373	171	367	---	498	690	248	263	229	504
Oct. 16------	38	435	516	50	241	403	23	182	318	123	346	---	506	694	42	513	444	---
Oct. 17------	27	531	514	13	229	476	30	75	345	272	382	---	362	701	72	491	310	476
Oct. 18------	38	597	495	43	116	458	---	65	248	341	347	---	529	690	(293)	475	434	473
Oct. 19------	36	410	493	105	181	442	27	150	322	326	79	297	465	695	291	323	372	(449)
Oct. 20------	23	360	380	41	33	440	30	49	221	208	258	181	448	---	320	464	371	(367)
Oct. 21------	59	455	478	37	230	409	28	62	306	166	285	155	489	669	(130)	493	109	468
Averages------	37	469	485	48	188	443	27	96	305	230	295	---	471	690	(199)	432	324	(456)
Departures----	---	---	---	---	---	---	---	---	---	-53	---	---	---	---	---	---	---	---
Oct. 22------	79	228	475	126	178	440	24	85	310	279	315	235	465	659	76	453	385	415
Oct. 23------	54	284	469	116	313	423	13	105	244	275	344	240	396	640	223	421	389	406
Oct. 24------	37	562	463	32	169	417	13	88	31	314	339	293	442	692	260	454	290	279
Oct. 25------	63	243	450	27	305	323	35	59	47	310	---	270	423	686	(271)	462	198	126
Oct. 26------	44	290	473	40	296	376	21	64	252	151	---	95	299	447	305	429	123	353
Oct. 27------	34	237	477	165	289	323	14	118	298	47	374	46	300	632	7	436	165	---
Oct. 28------	27	514	470	43	272	341	17	38	241	315	317	276	218	667	102	355	88	---
Averages------	48	337	468	78	260	378	20	79	203	242	338	208	363	631	(178)	430	234	316
Departures----	---	---	---	---	---	---	---	---	---	30	---	---	---	---	---	---	---	---
Oct. 29------	35	461	428	74	279	397	12	71	137	36	319	32	443	679	147	296	238	---
Oct. 30------	26	206	449	30	264	425	7	33	102	15	305	16	133	608	35	436	203	---
Oct. 31------	9	330	450	138	256	235	8	39	(154)	131	294	128	290	695	165	438	391	---
Nov. 1------	20	343	430	65	207	372	9	27	300	134	295	159	191	687	35	438	214	---
Nov. 2------	19	376	423	42	31	375	8	73	283	197	297	127	258	688	236	212	365	---
Nov. 3------	26	259	384	1	77	422	6	46	226	20	283	23	425	678	20	---	215	---
Nov. 4------	17	551	425	34	56	36	6	45	254	184	257	164	323	657	103	331	365	---
Averages------	22	361	427	55	167	323	8	48	(208)	102	293	93	295	670	106	358	284	---
Departures----	---	---	---	---	---	---	---	---	---	-94	---	---	---	---	---	---	---	---
Accumulated Departures January 1 to November 4, 1954	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

	East Lansing, Mich.	East Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Ely, Nevada	Fairbanks, Alaska	Fort Worth, Tex.	Fresno, Calif.	Grand Junction,Colo.	Great Falls, Mont.	Greensboro, N. C.	Griffin, Ga.	Hatteras, N. C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.	Lake Charles, La.	Las Vegas, Nevada
1954																		
Oct. 1------	90	180	(143)	509	540	193	204	---	529	417	412	406	570	263	---	216	423	542
Oct. 2------	109	327	101	343	535	215	545	452	412	441	443	476	539	208	---	269	520	508
Oct. 3------	224	178	244	513	430	211	586	473	368	72	480	389	510	312	---	78	351	374
Oct. 4------	139	131	300	493	260	171	490	466	194	127	449	443	533	187	---	100	469	510
Oct. 5------	47	422	342	476	499	199	441	465	490	211	430	438	519	259	---	199	459	504
Oct. 6------	316	65	284	482	477	94	467	451	437	383	421	323	502	244	---	176	474	493
Oct. 7------	368	445	208	424	490	136	343	458	378	381	499	132	197	459	---	399	467	488
Averages------	185	250	(232)	463	462	174	439	461	401	290	448	372	481	276	---	205	452	488
Departures----	-61	-41	---	---	---	56	---	20	---	---	---	---	---	---	---	-66	---	---
Oct. 8------	103	423	222	529	358	99	(548)	436	368	386	414	244	472	241	---	415	375	478
Oct. 9------	214	375	259	521	446	143	503	459	416	359	410	414	445	360	---	110	415	494
Oct. 10------	90	144	250	503	472	133	450	449	449	394	440	463	491	323	---	65	299	489
Oct. 11------	61	306	(174)	545	458	114	434	440	474	369	439	378	498	121	---	242	404	475
Oct. 12------	153	281	283	540	450	40	547	431	460	394	412	232	513	32	---	256	349	463
Oct. 13------	324	334	272	529	420	144	557	448	237	299	380	408	407	240	546	260	247	459
Oct. 14------	70	326	281	520	460	121	566	431	477	385	289	348	(362)	63	515	290	357	471
Averages------	145	313	(249)	527	438	113	(515)	442	412	369	398	355	(455)	197	---	234	350	475
Departures----	-78	38	---	---	---	23	---	34	---	---	---	---	---	---	---	-47	---	---
Oct. 15------	68	346	203	507	446	93	588	432	461	358	41	439	135	237	535	51	547	472
Oct. 16------	70	192	205	528	---	(90)	578	406	454	361	289	429	468	164	---	347	540	459
Oct. 17------	198	320	233	511	(433)	66	563	365	434	315	452	484	482	329	500	152	496	442
Oct. 18------	226	364	167	497	434	77	555	418	443	343	399	465	474	243	501	119	495	440
Oct. 19------	302	363	78	509	268	33	521	398	413	---	292	456	434	330	469	245	482	403
Oct. 20------	241	250	203	500	410	43	532	340	361	346	424	451	318	365	428	340	483	429
Oct. 21------	283	131	255	459	409	49	391	389	403	271	409	436	423	366	472	252	461	427
Averages------	198	281	192	501	(400)	(65)	533	393	424	333	329	452	391	290	484	215	501	439
Departures----	-31	10	---	---	---	-11	---	22	---	---	---	---	---	---	---	-47	---	---
Oct. 22------	278	246	250	490	390	22	60	381	410	117	409	455	462	348	429	374	265	422
Oct. 23------	269	313	237	476	261	30	94	403	404	36	397	433	473	345	481	332	187	359
Oct. 24------	267	338	245	317	207	29	(399)	407	260	99	395	409	459	353	450	154	257	432
Oct. 25------	224	331	221	487	404	100	(255)	406	156	142	364	372	377	91	458	310	298	408
Oct. 26------	164	201	150	481	293	89	309	390	378	333	323	390	440	70	465	224	393	411
Oct. 27------	161	135	61	472	424	47	140	393	405	293	316	318	408	70	458	22	165	403
Oct. 28------	257	334	219	454	402	54	481	---	394	232	337	339	354	237	463	340	130	404
Averages------	231	271	197	454	340	53	(248)	397	344	179	363	388	425	216	458	251	242	405
Departures----	55	58	---	---	---	-5	---	43	---	---	---	---	---	---	---	64	---	---
Oct. 29------	110	74	---	417	380	37	(509)	378	391	222	288	398	286	242	444	114	460	393
Oct. 30------	76	36	---	469	377	61	484	367	389	242	304	417	223	149	454	126	306	395
Oct. 31------	167	169	---	462	366	51	521	349	379	275	355	312	279	183	411	100	477	391
Nov. 1------	106	243	---	383	332	53	(427)	344	370	290	300	415	443	33	400	164	325	376
Nov. 2------	58	169	126	317	360	26	473	291	150	286	84	407	84	212	373	26	378	304
Nov. 3------	178	59	197	437	366	24	46	318	359	262	344	456	436	312	414	24	252	373
Nov. 4------	31	235	93	452	356	67	412	338	359	237	155	59	(380)	89	401	57	87	379
Averages------	104	141	---	419	362	46	(410)	341	342	259	261	352	(304)	174	414	87	327	373
Departures----	-45	-51	---	---	---	0	---	12	---	---	---	---	---	---	---	-74	---	---
Accumulated Departures January 1 to November 4, 1954	-2114	---	---	---	---	---	---	8022	---	---	---	---	---	---	---	-4459	---	---

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

SOLAR RADIATION DATA

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.-Continued

OCTOBER 1954

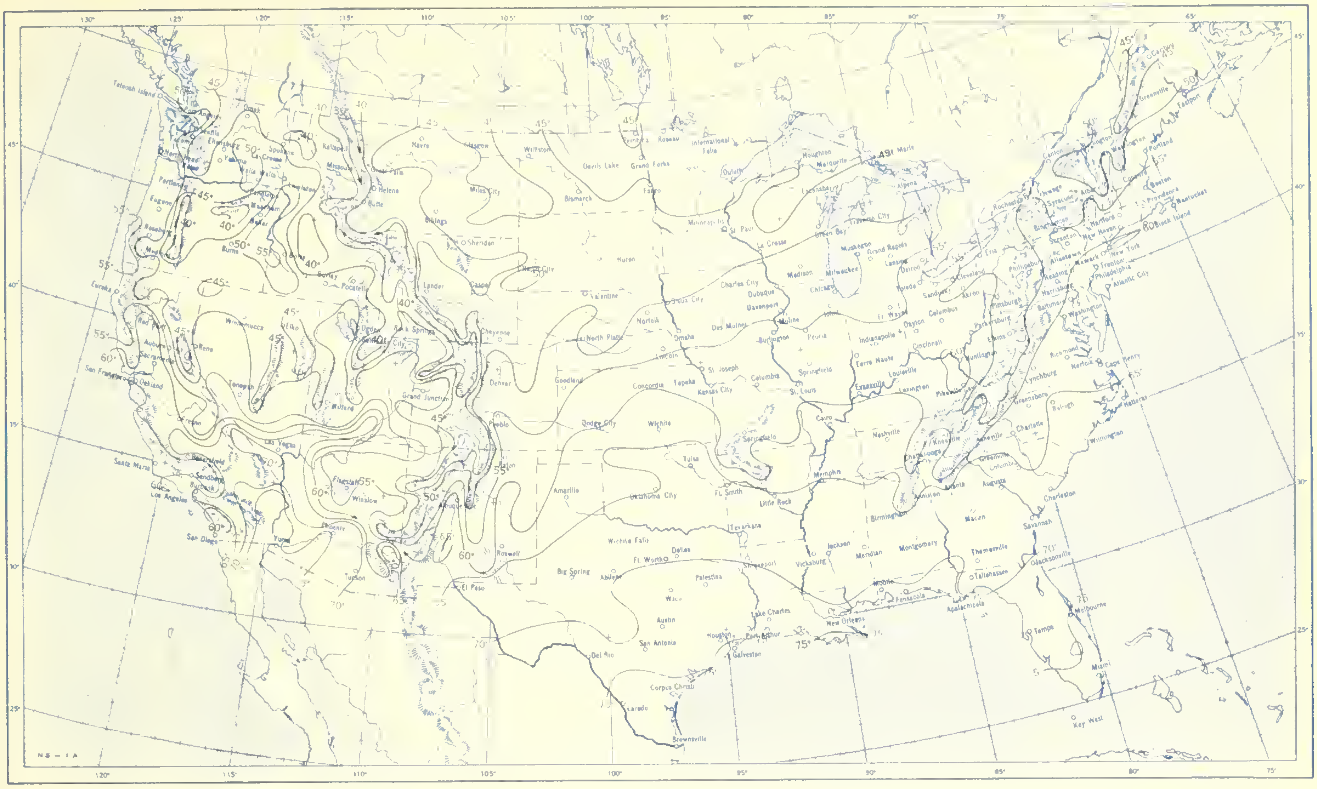
1954	Lincoln, Nebr.	Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBCO)	Madison, Wisc.	Medford, Ore.	Miami, Fla.	Midland, Tex.	Nashville, Tenn.	Newport, R. I.	New York, N. Y.	Oak Ridge, Tenn.	Oklahoma City, Okla	Ottawa, Ontario	Phoenix, Ariz.	Prosser 4 NE, Wash.	Rapid City, S. Dak.	Riverside, Calif.
Oct. 1------	55	201	368	316	80	466	232	286	296	211	258	233	167	282	549	466	260	352
Oct. 2------	175	321	344	305	70	441	307	400	338	381	283	376	465	160	151	452	436	390
Oct. 3------	407	417	177	164	136	459	461	511	---	174	298	478	508	36	452	430	459	185
Oct. 4------	37	375	491	454	276	448	524	526	310	163	227	432	525	250	535	366	154	411
Oct. 5------	44	410	304	371	50	289	378	172	406	442	421	382	384	371	529	230	242	471
Oct. 6------	138	246	264	219	379	247	396	272	161	53	169	230	245	171	515	215	211	238
Oct. 7------	99	456	462	466	362	345	173	325	490	484	474	264	256	443	499	184	437	479
Averages------	136	347	344	328	193	385	353	356	334	273	304	342	364	245	461	335	314	361
Departures----	-192	---	---	---	-91	---	---	---	-24	-30	2	---	---	---	---	---	---	-40
Oct. 8------	173	445	444	453	41	363	374	387	254	460	348	174	382	396	517	337	428	466
Oct. 9------	342	337	388	428	146	382	388	389	390	348	286	178	486	45	512	394	190	480
Oct. 10------	185	405	271	384	11	417	348	497	454	268	270	449	459	(358)	543	307	401	470
Oct. 11------	373	353	---	297	182	418	562	578	358	323	373	394	402	38	538	392	337	466
Oct. 12------	427	295	321	309	266	117	(445)	433	427	323	306	262	453	(65)	526	186	373	440
Oct. 13------	167	252	261	329	315	303	479	501	192	354	354	297	477	363	522	388	179	421
Oct. 14------	363	230	311	428	69	379	373	489	311	305	289	327	517	(149)	519	374	420	475
Averages------	290	331	332	375	147	340	(424)	468	341	340	318	297	454	(202)	525	340	333	460
Departures----	-25	---	---	---	-117	---	---	---	28	31	34	---	---	---	---	---	---	69
Oct. 15------	361	454	453	439	160	306	459	499	441	325	108	354	529	159	515	315	400	490
Oct. 16------	399	441	363	424	312	268	484	491	267	131	357	186	517	225	505	248	389	463
Oct. 17------	390	423	429	415	256	293	457	498	466	348	383	448	496	(178)	489	335	391	471
Oct. 18------	297	405	455	436	326	339	(508)	496	436	391	284	379	500	(319)	498	295	195	471
Oct. 19------	114	396	431	397	333	297	427	479	454	370	223	429	447	206	493	157	373	468
Oct. 20------	284	256	416	400	297	256	536	474	453	221	242	419	446	348	473	140	367	438
Oct. 21------	242	249	400	389	294	221	414	461	419	159	223	420	276	337	484	45	327	447
Averages------	298	375	421	414	282	283	(469)	485	419	278	260	376	459	(253)	494	219	349	464
Departures----	0	---	---	---	43	---	---	---	90	-11	-6	---	---	---	---	---	---	102
Oct. 22------	194	354	249	328	287	294	417	451	423	389	409	402	185	349	476	265	348	234
Oct. 23------	351	364	423	282	288	368	488	338	417	354	346	407	273	242	327	347	351	412
Oct. 24------	222	148	327	337	269	351	407	370	402	357	340	389	360	320	440	303	53	446
Oct. 25------	244	222	424	395	233	343	435	362	370	360	280	380	176	(127)	486	328	107	430
Oct. 26------	110	100	392	376	43	360	501	422	235	264	211	221	170	78	474	318	223	441
Oct. 27------	362	152	413	408	275	345	190	173	126	170	150	211	430	71	464	310	371	447
Oct. 28------	239	88	410	405	271	296	189	433	133	361	352	259	---	300	444	288	285	446
Averages------	246	204	377	362	238	337	375	364	301	322	298	324	266	(212)	444	308	248	408
Departures----	-35	---	---	---	23	---	---	---	31	88	71	---	---	---	---	---	---	69
Oct. 29------	153	207	403	387	122	295	371	447	100	45	9	124	455	42	458	290	337	432
Oct. 30------	122	253	351	363	117	305	336	431	216	36	28	331	337	(134)	461	275	210	412
Oct. 31------	269	365	337	311	278	298	467	418	134	160	281	---	450	(170)	447	272	306	384
Nov. 1------	201	348	247	195	87	285	485	295	174	278	261	---	442	234	449	277	309	138
Nov. 2------	338	383	306	234	123	146	337	96	259	160	5	276	444	153	428	268	324	267
Nov. 3------	249	188	321	300	246	249	474	348	371	35	28	383	97	21	414	260	281	318
Nov. 4------	330	159	372	355	34	275	466	427	51	267	235	---	447	67	425	214	309	405
Averages------	237	272	334	306	144	265	419	352	186	140	121	279	382	(118)	440	265	297	337
Departures----	3	---	---	---	-42	---	---	---	-41	-66	-80	---	---	---	---	---	---	20
Accumulated Departures January 1 to November 4, 1954	---	---	---	---	-1408	---	---	---	---	---	---	---	---	---	---	---	---	17003

1954	St. Cloud, Minn.	San Antonio, Tex.	Santa Maria, Calif.	S. Ste. Marie, Mich	Sayville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle, Wash. (WBAS)	Spokane, Wash.	State College, Pa.	Stillwater, Okla.	Swan Island., W. I.	Tampa, Fla.	Toronto, Ontario	Upton, N. Y.	Wake Island, Pacific Area	Washington, D. C. (Silver Hill Obs.)	Winnipeg, Manitoba
Oct. 1------	105	404	289	111	242	311	---	373	478	199	131	466	432	111	290	---	250	154
Oct. 2------	297	417	368	384	299	166	---	200	399	272	387	464	392	108	305	---	211	---
Oct. 3------	155	519	440	72	109	160	---	223	376	88	456	82	468	205	118	526	330	---
Oct. 4------	---	304	452	350	251	173	---	236	402	62	463	156	442	356	245	---	367	---
Oct. 5------	178	281	415	238	470	260	---	175	328	56	270	519	468	103	469	589	253	---
Oct. 6------	---	381	309	365	87	224	107	142	368	112	156	482	456	218	88	508	100	338
Oct. 7------	191	470	464	398	508	358	470	187	237	432	259	608	319	423	492	590	510	160
Averages------	185	397	391	274	281	236	---	220	370	175	303	397	426	218	287	553	289	---
Departures----	---	---	---	---	---	---	---	---	---	-106	---	---	---	---	---	---	---	---
Oct. 8------	81	441	438	(159)	---	379	---	208	410	316	436	462	309	392	468	585	402	161
Oct. 9------	222	349	(484)	63	276	135	---	252	417	315	423	499	440	120	276	568	418	323
Oct. 10------	51	448	512	244	(346)	69	---	84	256	106	410	570	463	24	372	268	373	314
Oct. 11------	136	468	500	78	414	142	---	256	354	291	302	544	422	137	398	272	418	291
Oct. 12------	360	471	492	52	404	227	---	280	421	293	412	580	367	76	401	344	424	135
Oct. 13------	24	492	505	327	(380)	203	378	309	401	231	---	599	424	369	393	347	393	341
Oct. 14------	---	451	(492)	22	214	254	249	281	396	302	453	597	438	156	257	558	257	167
Averages------	146	446	(489)	(135)	(339)	201	---	239	379	265	406	550	409	182	366	420	384	248
Departures----	---	---	---	---	---	---	---	---	---	2	---	---	---	---	---	---	---	---
Oct. 15------	114	536	447	188	264	94	64	311	382	5	459	475	443	21	282	314	---	173
Oct. 16------	---	522	(471)	53	356	281	371	182	286	218	442	436	522	137	291	387	380	326
Oct. 17------	324	509	(448)	261	433	291	374	255	331	123	426	306	514	199	404	373	402	325
Oct. 18------	378	498	460	238	430	200	353	154	316	79	434	52	501	(321)	405	558	235	288
Oct. 19------	252	499	459	331	327	43	48	115	149	261	---	153	497	285	(332)	535	97	287
Oct. 20------	321	485	455	305	253	285	151	49	211	284	295	381	476	73	(292)	483	363	274
Oct. 21------	278	487	445	296	210	244	339	135	121	262	202	477	485	333	(205)	388	338	268
Averages------	278	505	(455)	239	325	205	243	171	257	176	376	326	491	195	(316)	434	302	277
Departures----	---	---	---	---	---	---	---	---	---	-88	---	---	---	---	---	---	---	---
Oct. 22------	296	382	349	212	413	334	301	205	241	290	71	463	473	292	(415)	(304)	358	221
Oct. 23------	305	---	425	273	348	274	338	124	331	295	233	316	460	301	(347)	537	372	103
Oct. 24------	267	366	460	231	359	285	320	188	355	289	203	213	375	292	352	526	358	26
Oct. 25------	120	425	431	(157)	368	287	338	264	354	282	94	67	360	249	367	535	336	100
Oct. 26------	85	442	(429)	23	195	182	---	221	341	120	39	513	401	184	197	454	76	256
Oct. 27------	292	290	425	175	223	43	188	227	325	73	135	576	375	115	204	531	75	211
Oct. 28------	110	340	422	128	383	265	357	174	311	289	329	631	443	274	373	(542)	362	143
Averages------	211	374	(420)	(172)	327	239	307	201	323	234	158	397	412	244	(322)	(490)	277	152
Departures----	---	---	---	---	---	---	---	---	---	16	---	---	---	---	---	---	---	---
Oct. 29------	179	507	---	81	68	42	---	81	271	49	342	655	300	62	69	526	269	(228)
Oct. 30------	284	534	412	170	40	48	---	153	295	104	258	---	458	187	63	549	160	(200)
Oct. 31------	102	495	354	98	307	173	---	239	281	60	281	668	484	230	265	529	318	---
Nov. 1------	192	313	185	195	312	94	---	180	303	195	335	---	487	119	263	519	312	(242)
Nov. 2------	249	194	---	252	35	32	57	36	258	15	385	369	456	14	39	486	10	146
Nov. 3------	253	69	374	193	23	23	43	101	125	49	28	418	512	29	(53)	368	136	62
Nov. 4------	262	467	369	(81)	278	74	170	64	223	23	371	385	455	47	270	464	165	207
Averages------	217	368	339	(153)	152	70	---	122	251	71	286	499	450	98	(146)	491	196	(175)
Departures----	---	---	---	---	---	---	---	---	---	-103	---	---	---	---	---	---	---	---
Accumulated Departures January 1 to November 4, 1954	---	---	---	---	---	---	---	---	---	63	---	---	---	---	---	---	---	---

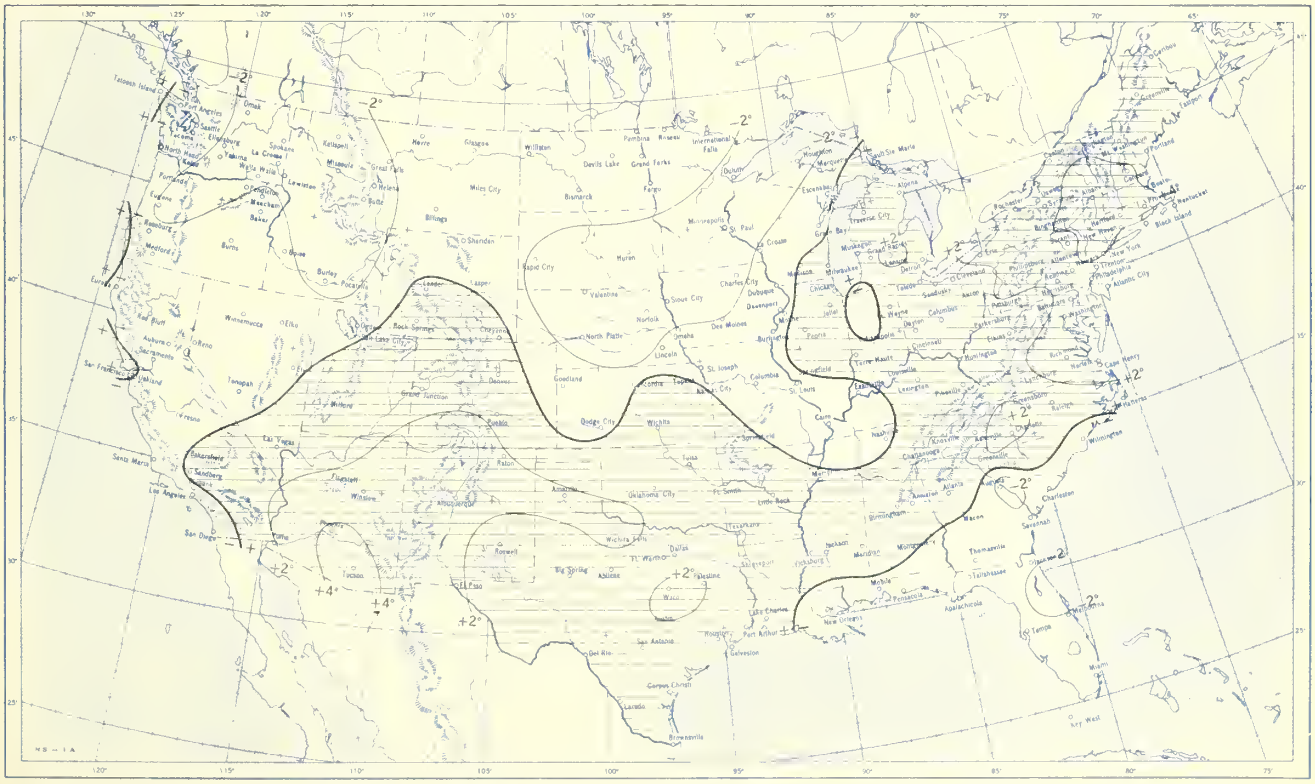
Note.--**Langley** is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

NWRC, Asheville, N.C. --- 1/12/55 --- 1800

Chart I. A. Average Temperature (°F.) at Surface, October 1954.



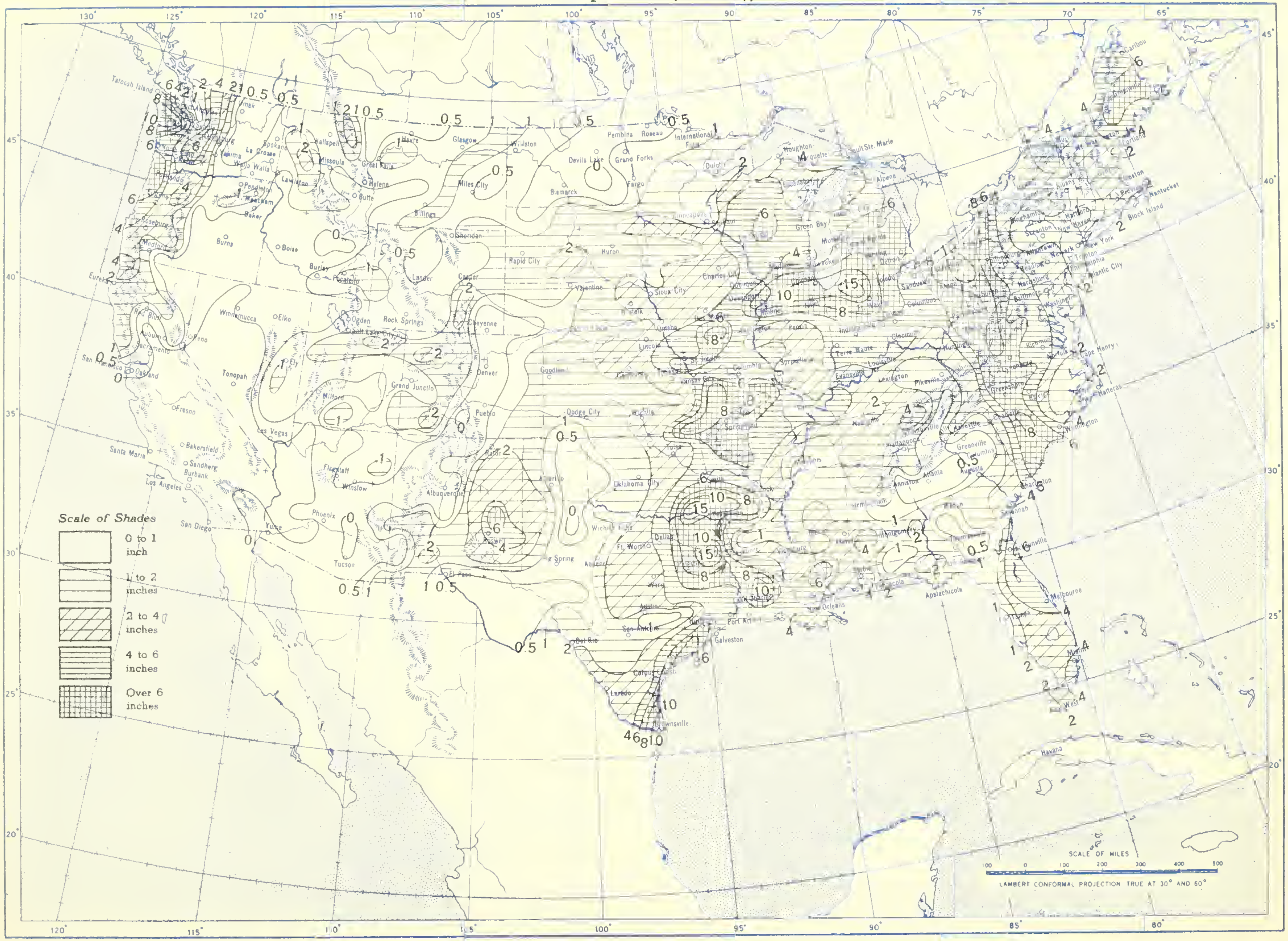
B. Departure of Average Temperature from Normal (°F.), October 1954.



A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.

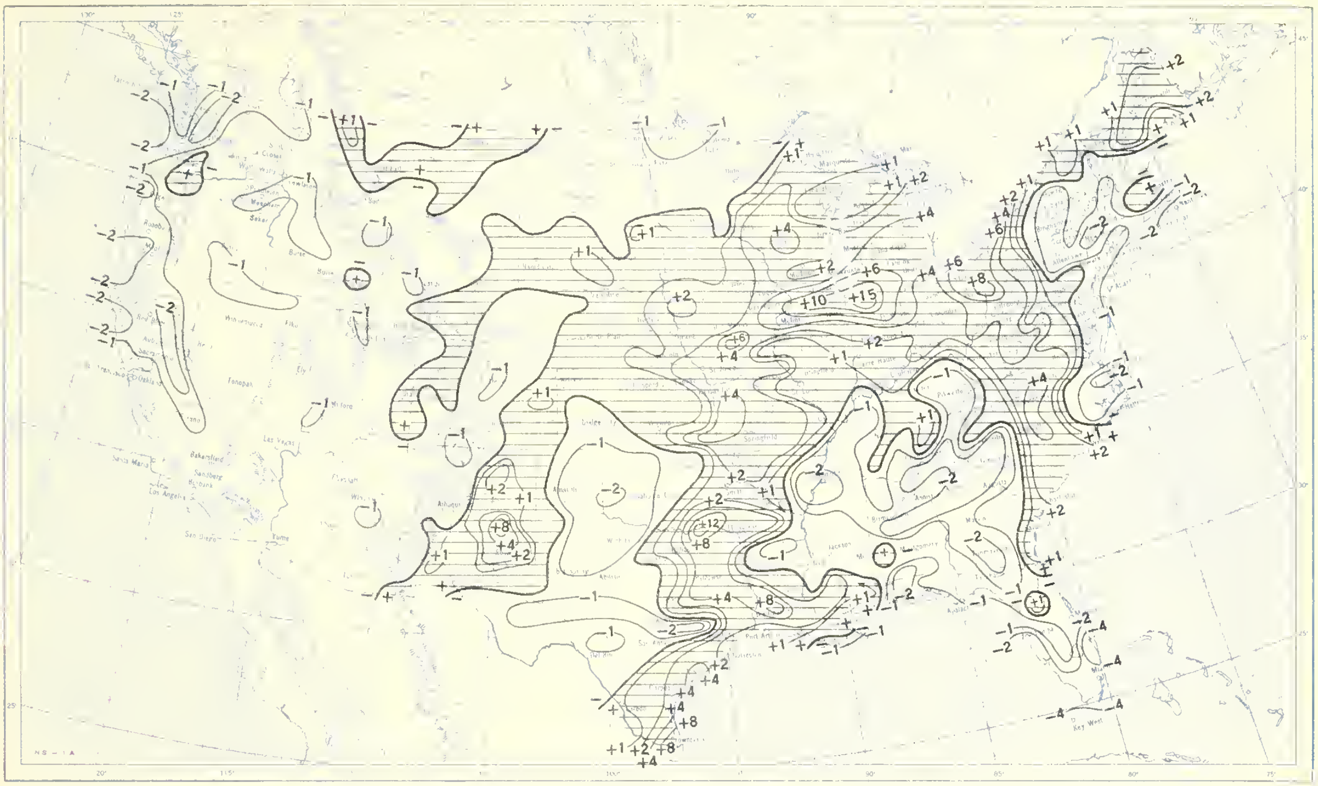
B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), October 1954.

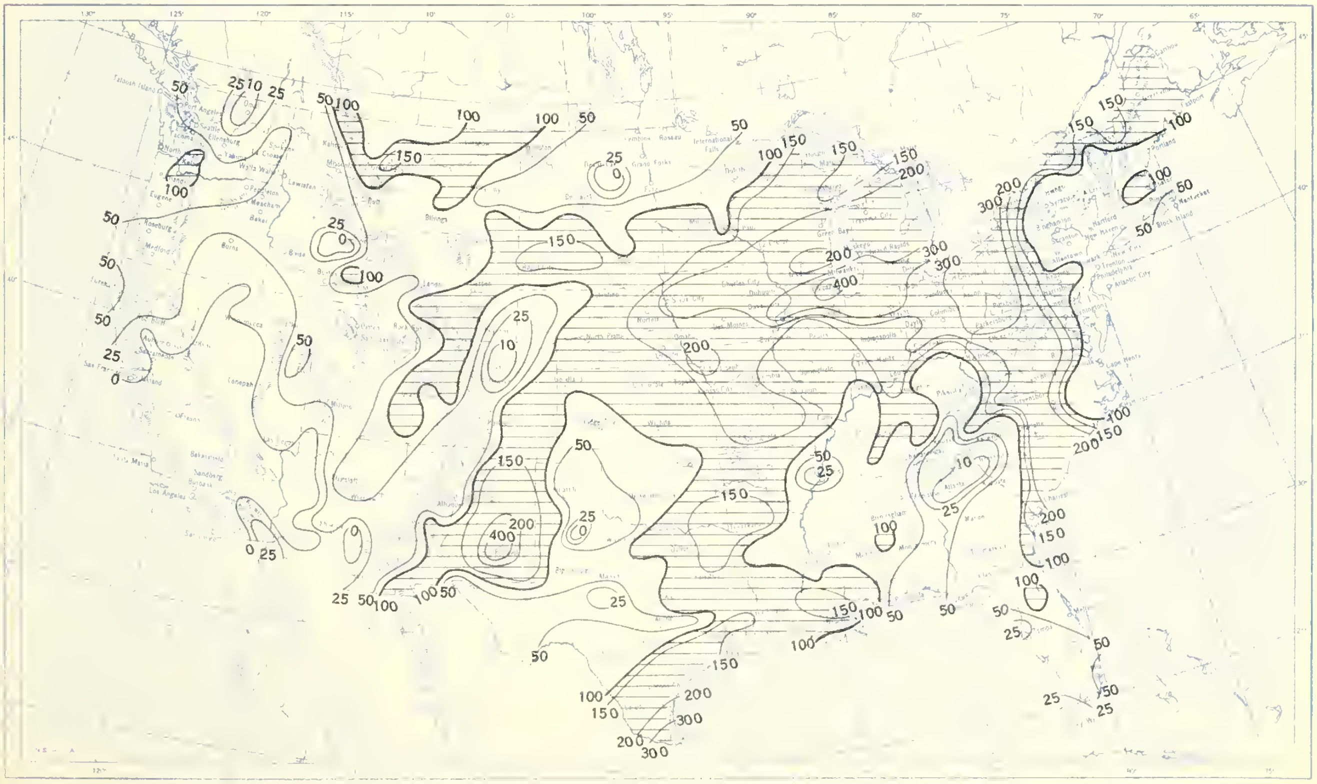


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), October 1954.

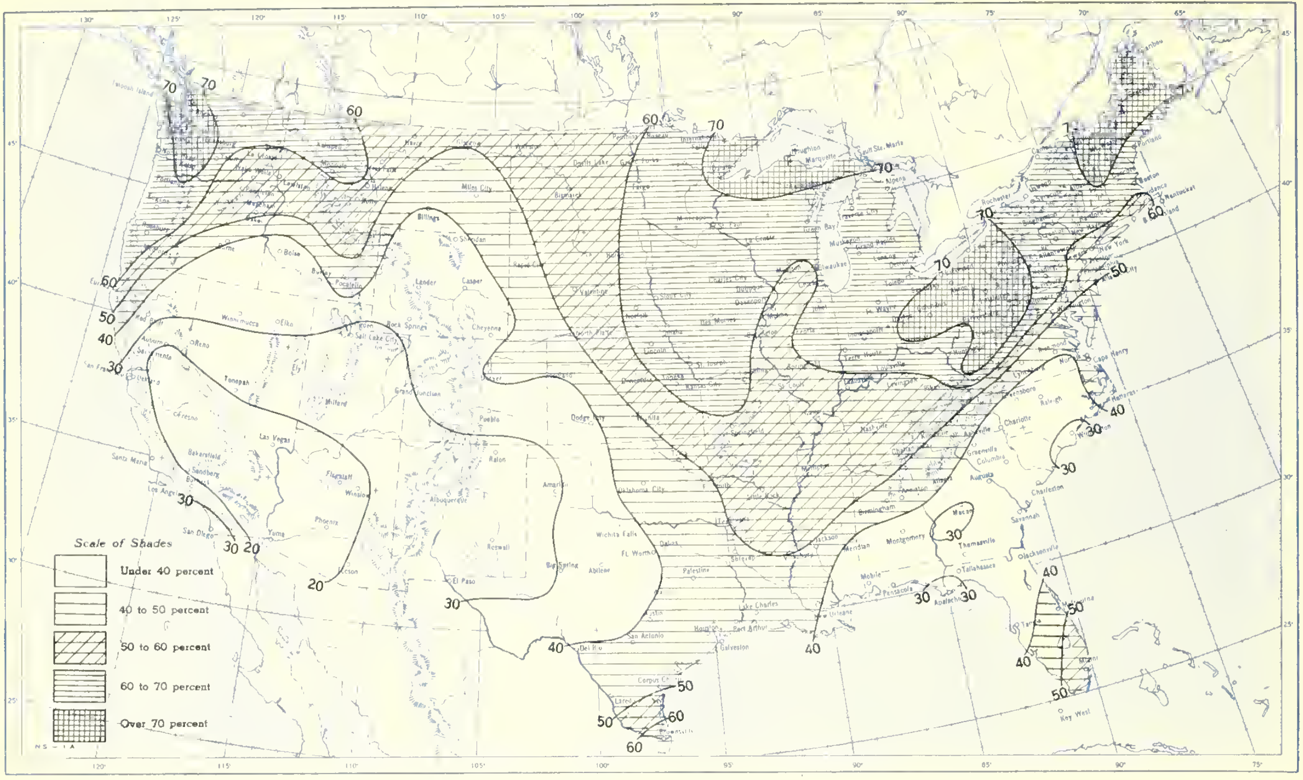


B. Percentage of Normal Precipitation, October 1954.

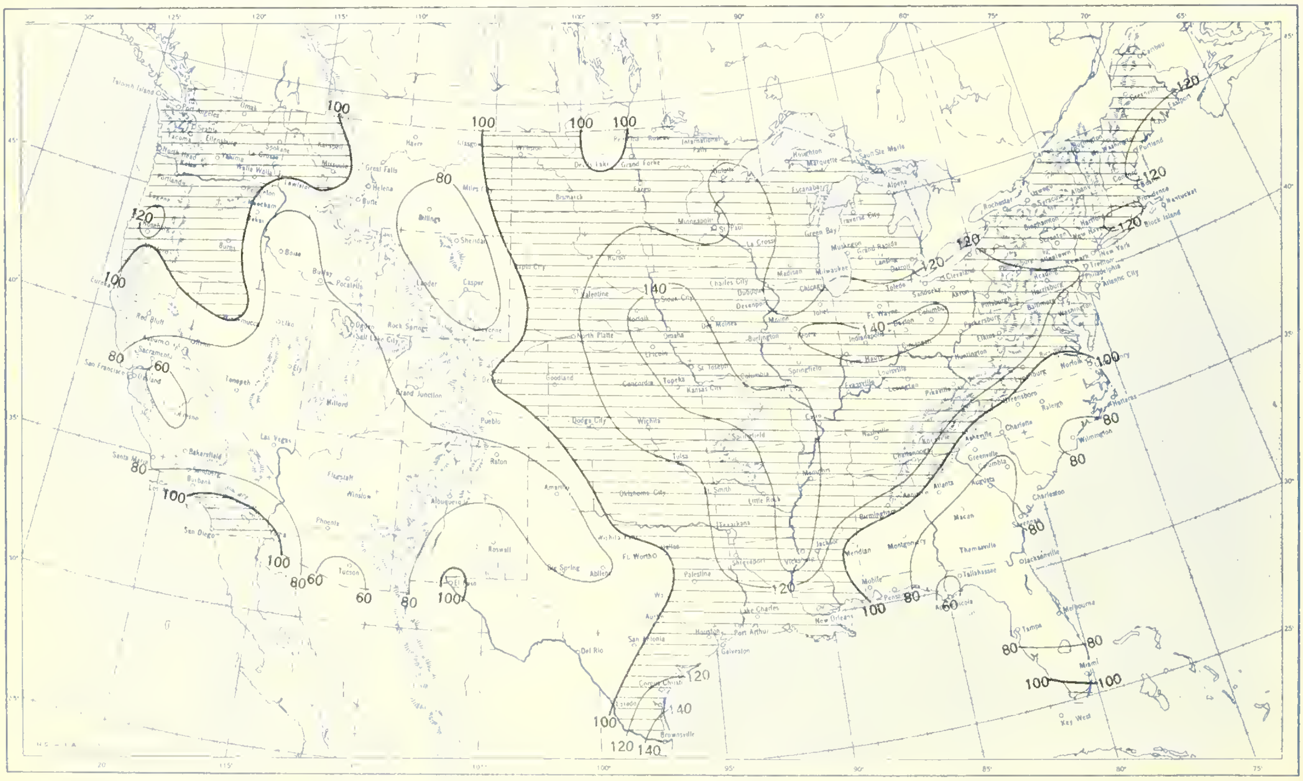


Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, October 1954.

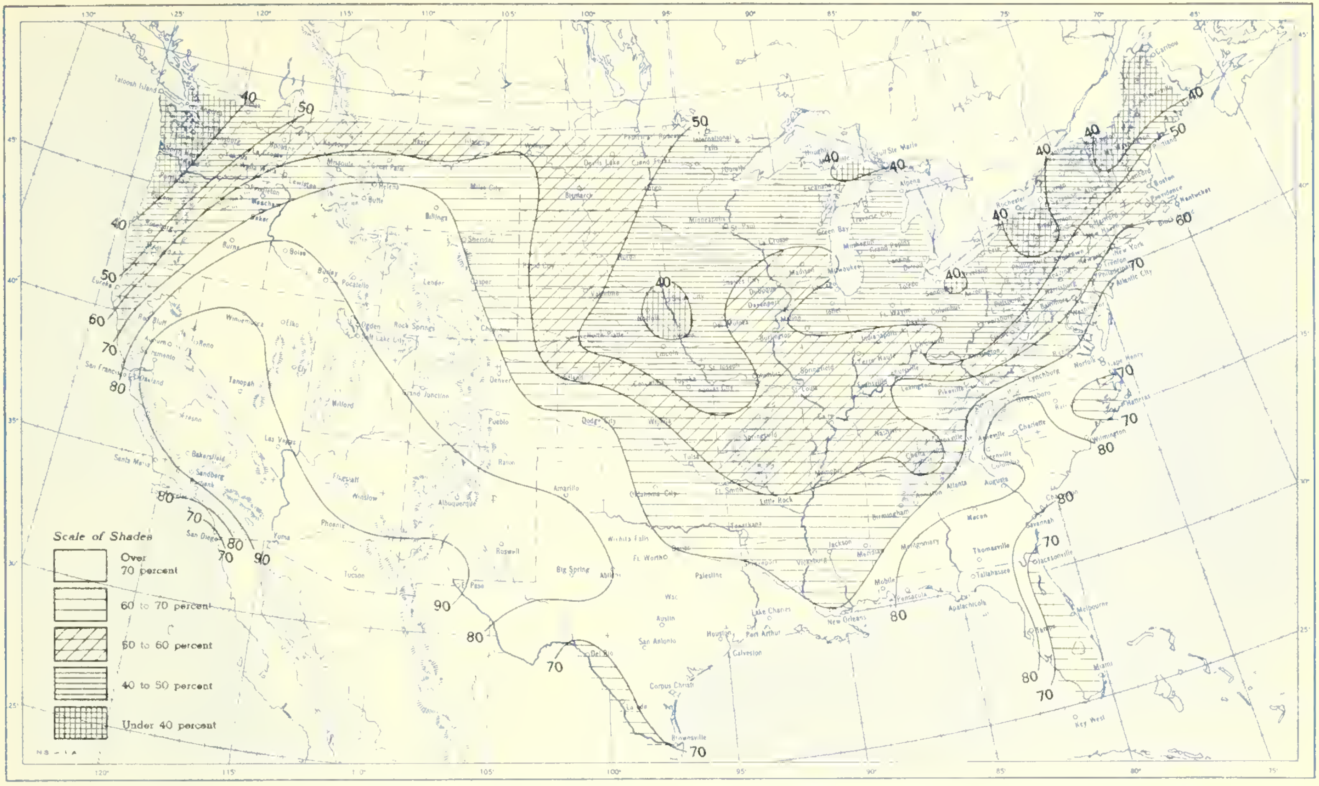


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, October 1954.

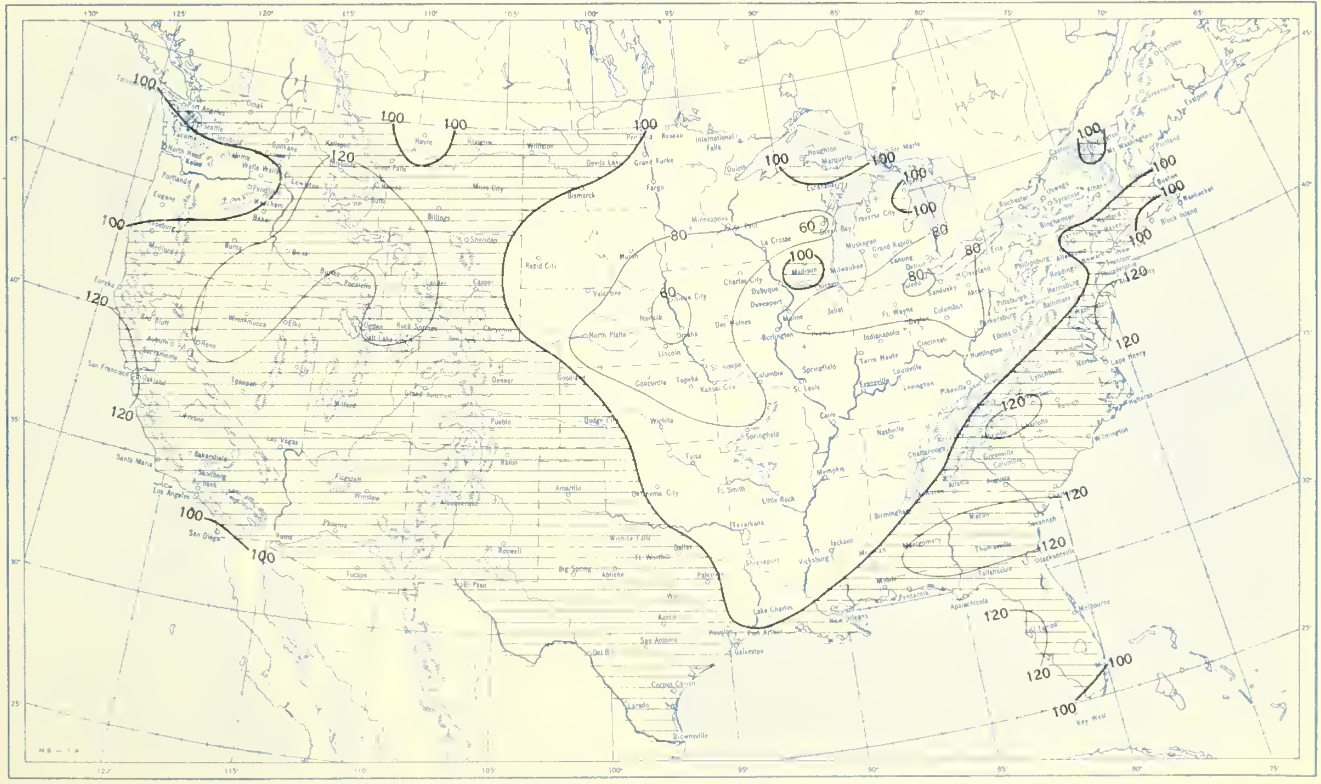


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, October 1954.



B. Percentage of Normal Sunshine, October 1954.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, October 1954. Inset: Percentage of Normal Average Daily Solar Radiation, October 1954.

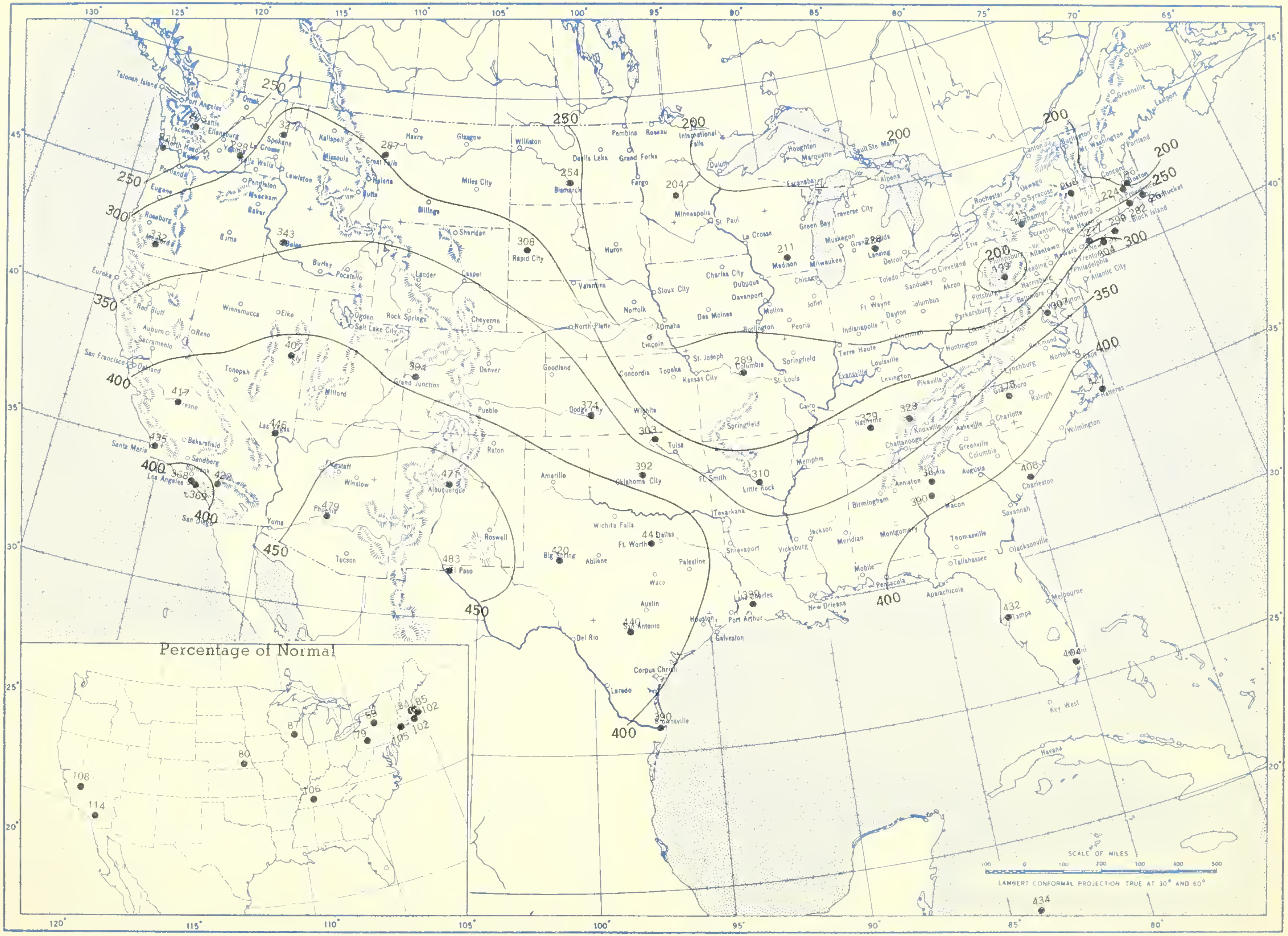
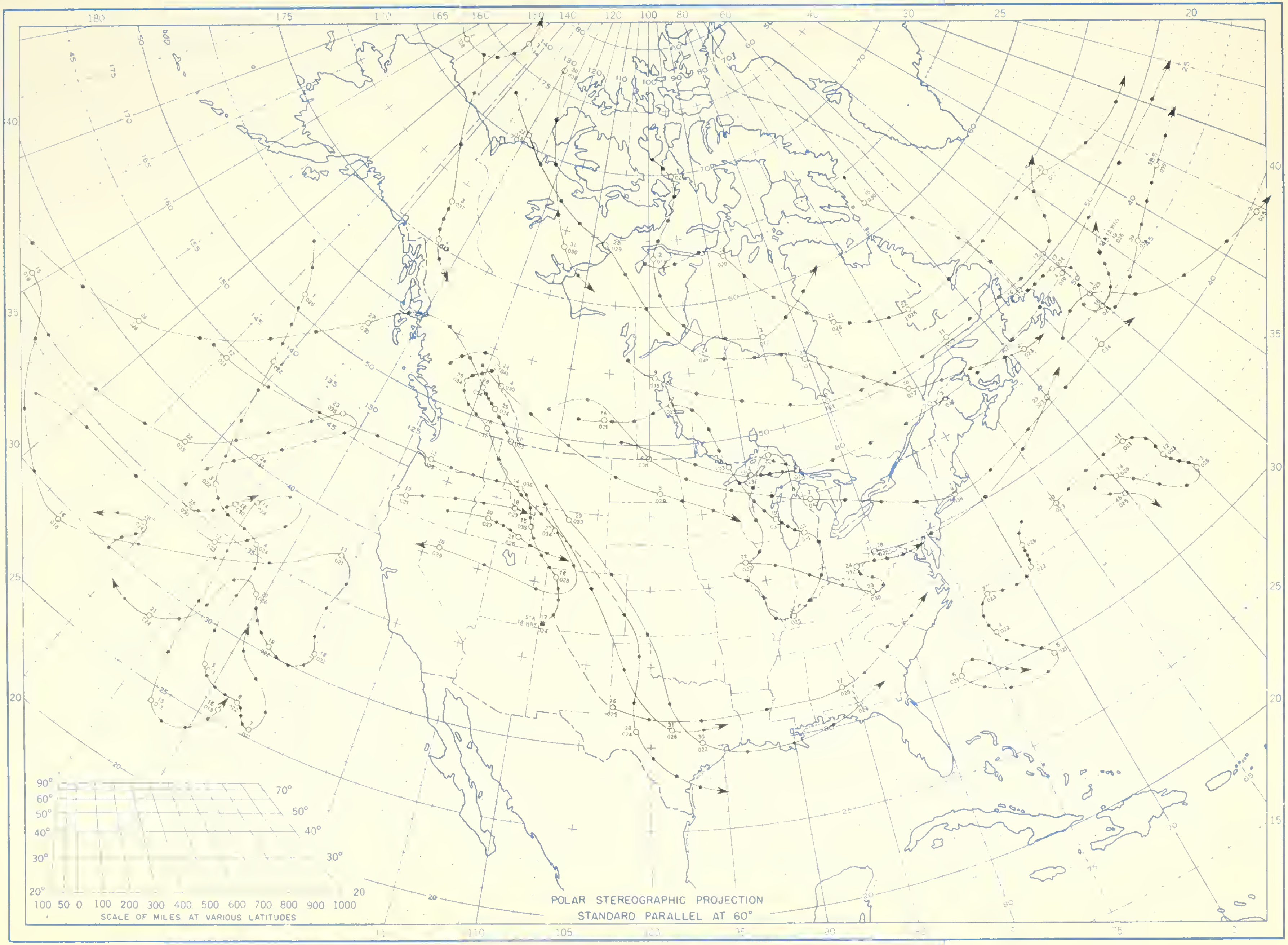


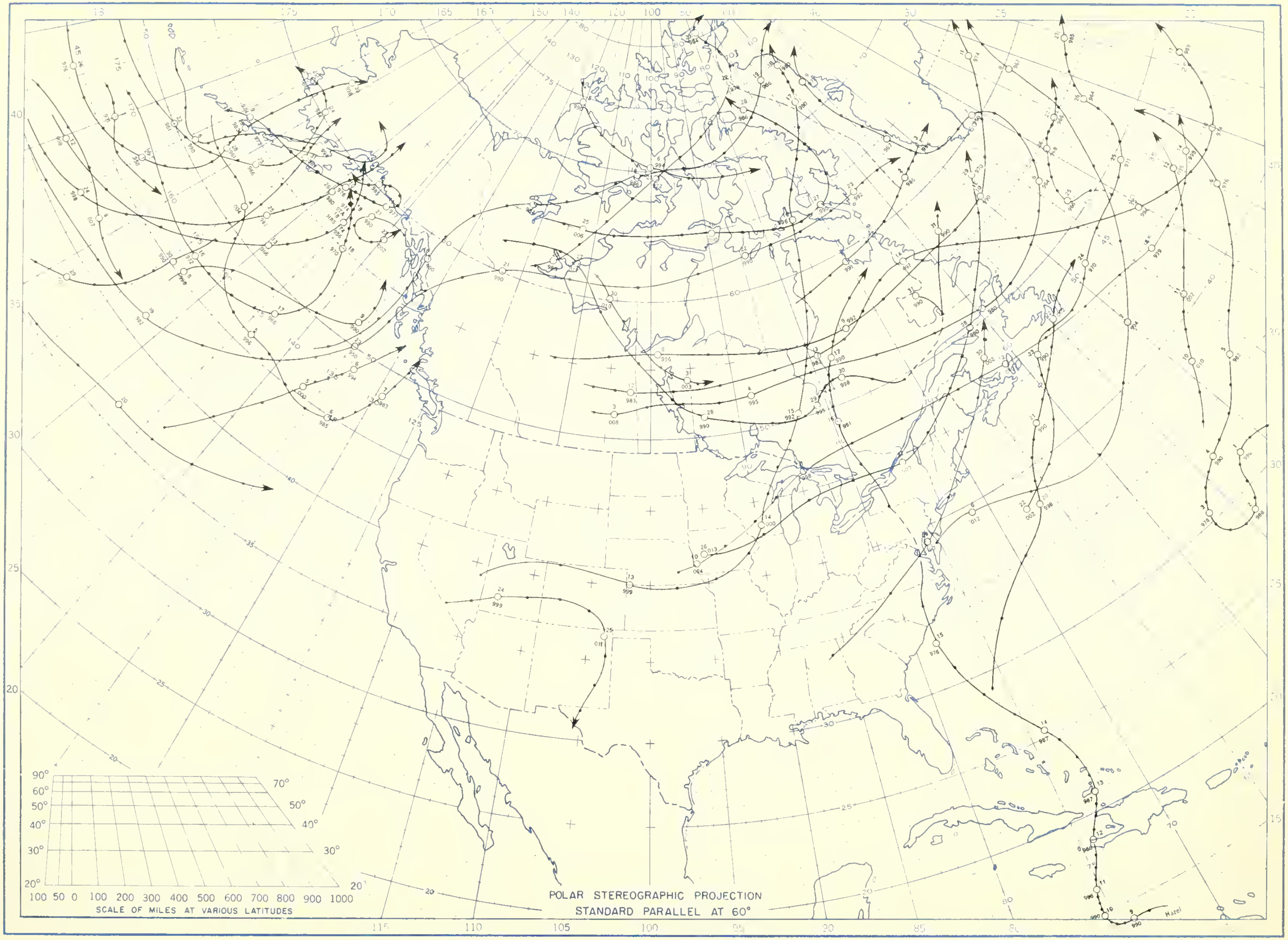
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm.$^{-2}$). Basic data for isolines are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are computed for stations having at least 9 years of record.

Chart IX. Tracks of Centers of Anticyclones at Sea Level, October 1954.



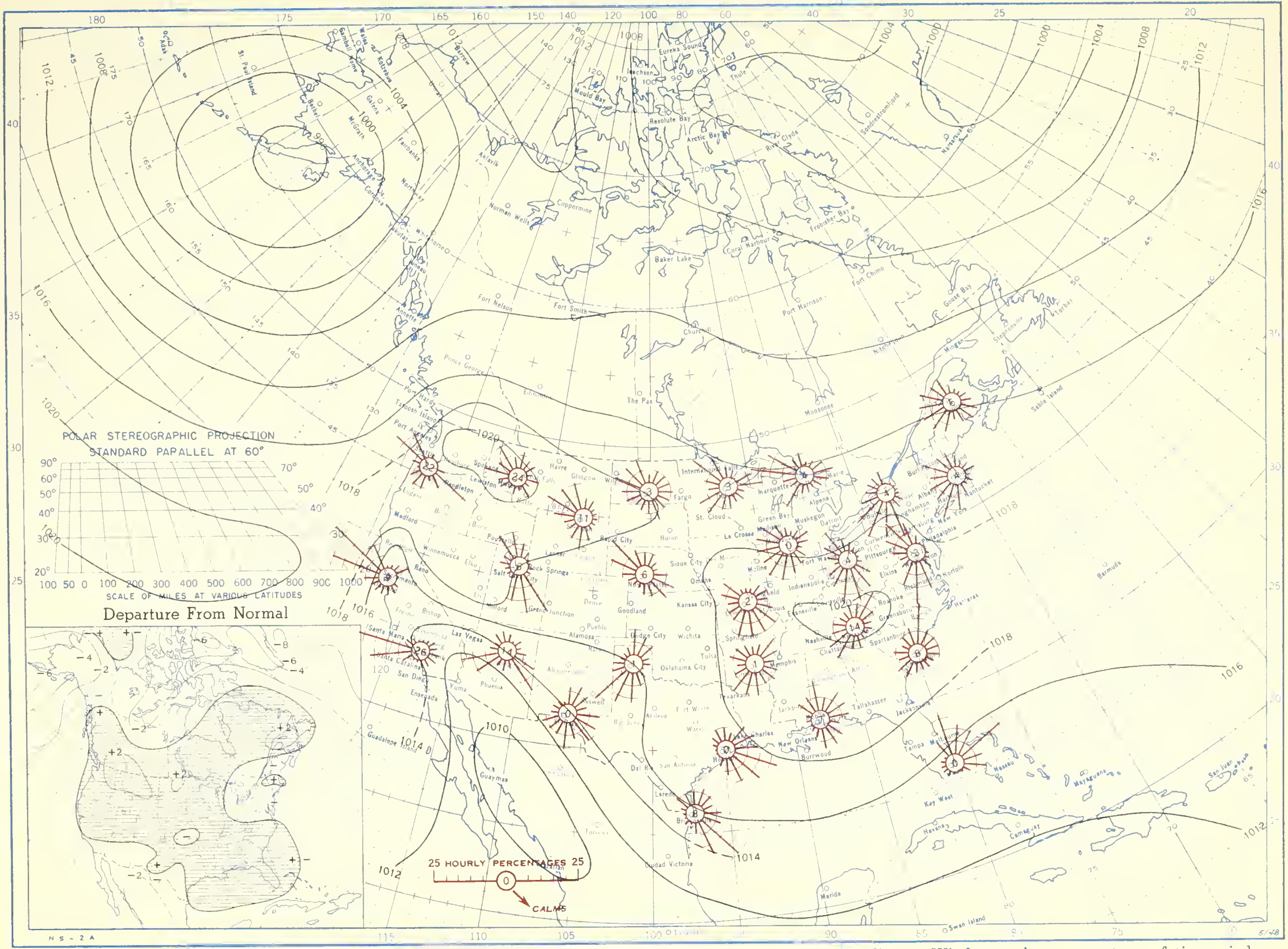
Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

Chart X. Tracks of Centers of Cyclones at Sea Level, October 1954.



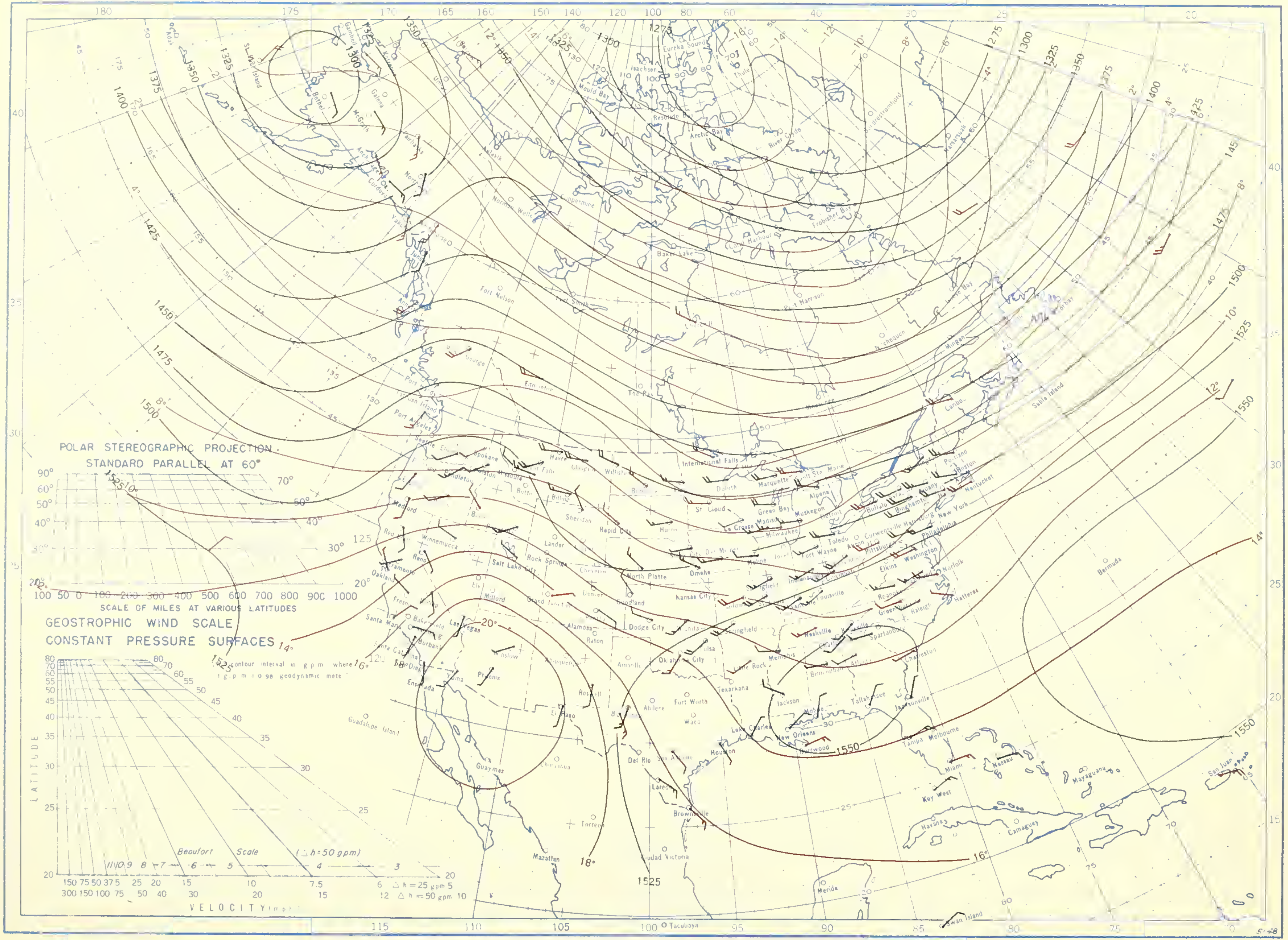
Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, October 1954. Inset: Departure of Average Pressure (mb.) from Normal, October 1954.



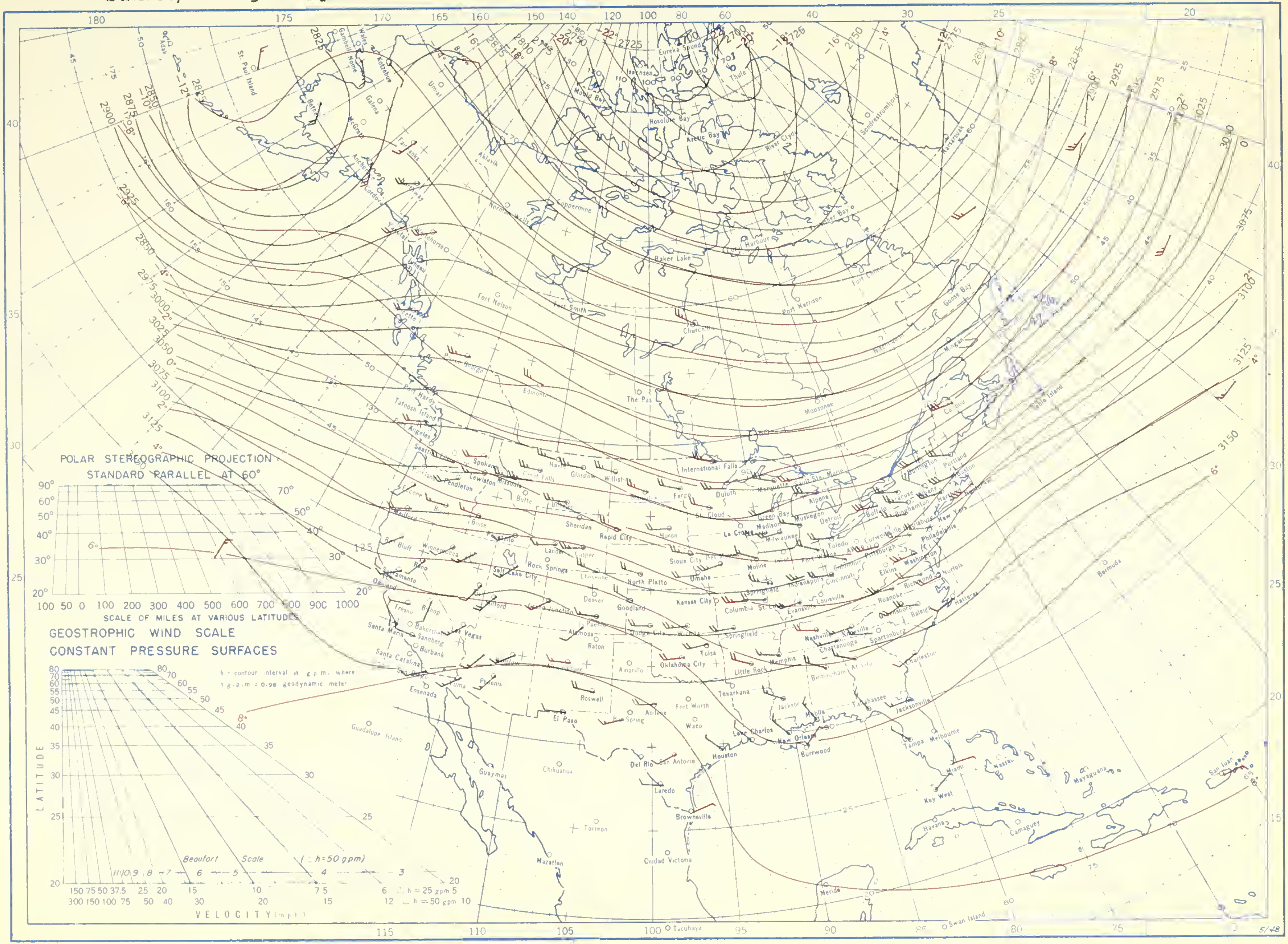
Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), October 1954.



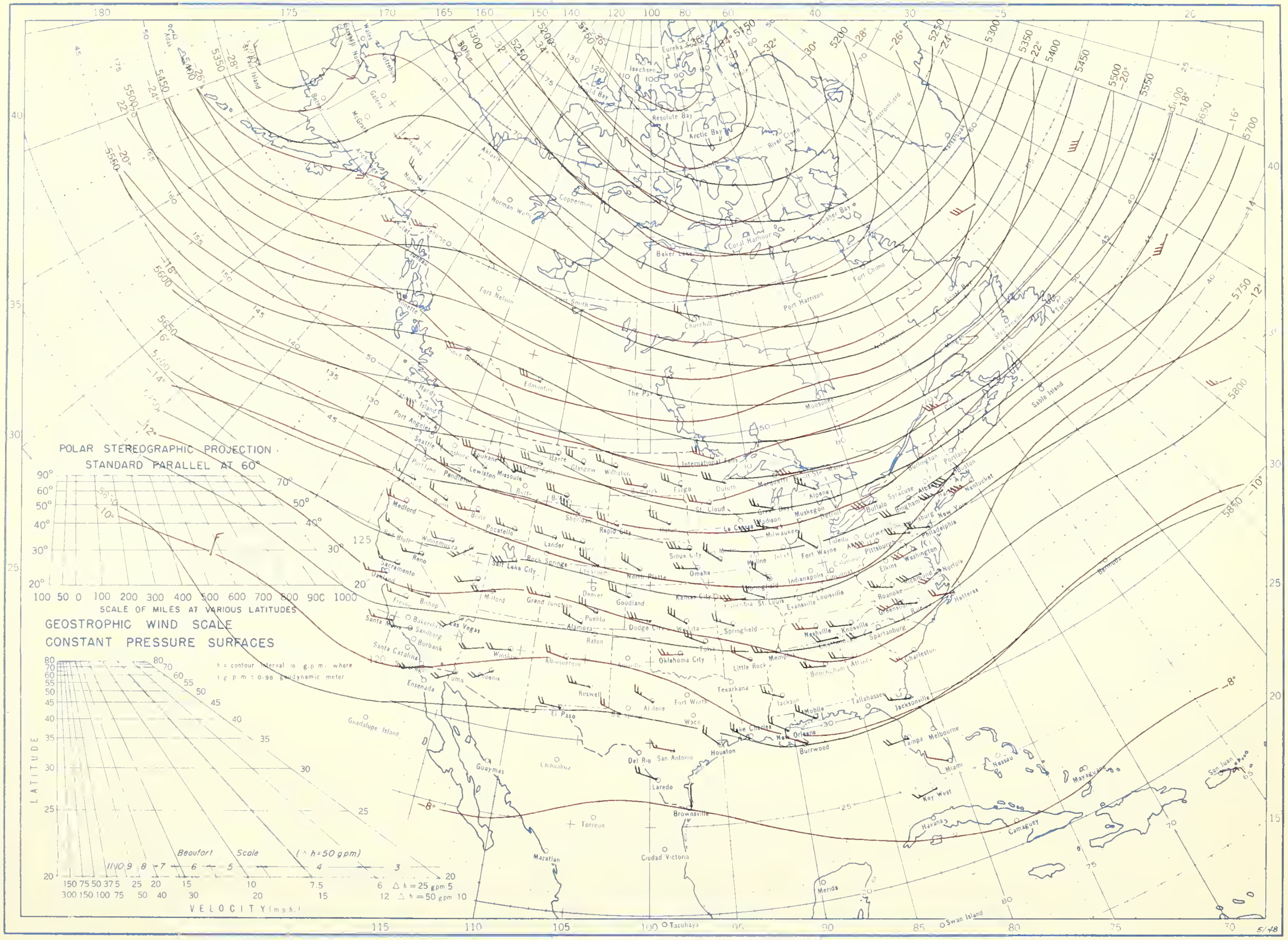
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m.. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), October 1954.



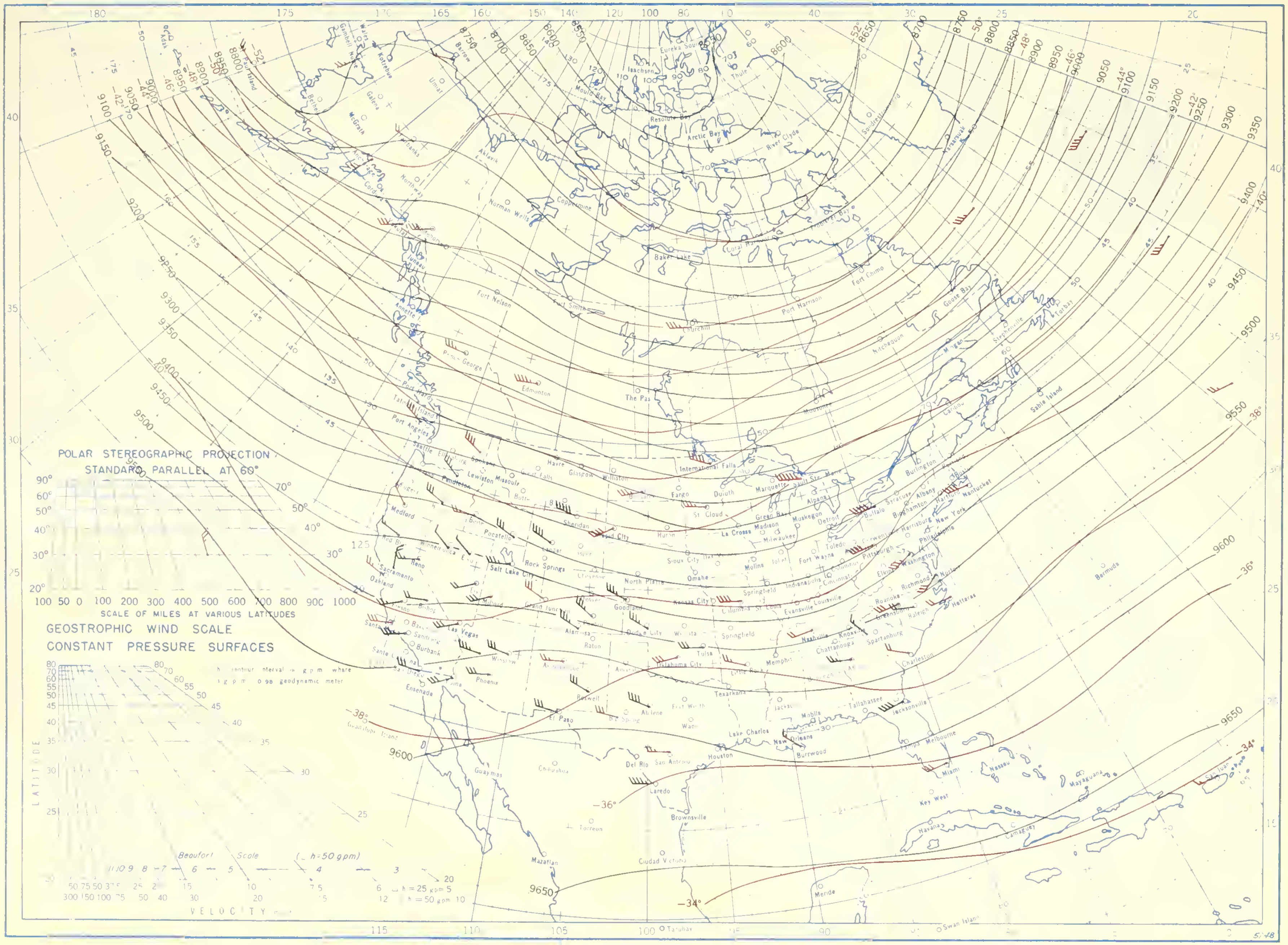
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), October 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 300-mb. Pressure Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), October 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

NOVEMBER 1954
Volume 5 No. 11

ASHEVILLE: 1955

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NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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CLIMATOLOGICAL DATA
NATIONAL SUMMARY

Volume 5 No. 11 NOVEMBER 1954

GENERAL SUMMARY OF WEATHER CONDITIONS

The month was mainly featured by mild, dry, sunny weather over the central portions of the Country. This combination with frequent strong winds and occasional blowing dust intensified the drought situation in the western portions of the lower Great Plains where grains and pastures deteriorated and water supplies dried up on an increasing number of farms. Moderate to heavy precipitation east of the Mississippi River, however, further improved soil moisture in the South and Southeast sufficiently for growth of fall-planted crops and germination of fall grains, although subsoil moisture still remained short.

In northern areas, open ranges most of the month and mild temperatures were very favorable for livestock, and mild weather resulted in savings of fuel. Fog, which was of frequent occurrence in California during the latter part of the month, hampered harvesting operations in the Central Valley and caused many traffic accidents in the Los Angeles area.

Thunderstorms were reported only in western Washington, along the north Atlantic Coast from Nantucket to Atlantic City, and east of a line joining Laredo, Tex., and Peoria, Ill. Sunshine was below normal in the Pacific states, slightly below in the Ohio Valley and the Atlantic Coastal States from Georgia to southern New England, but was well above normal over the remainder of the nation.

PRECIPITATION.--In the Ohio Valley and most of the area between the Mississippi River and the Continental Divide precipitation was less than 50 percent of normal. Only a few stations in Kansas, the western portions of the lower Great Plains, and southern portions of New Mexico and Arizona received any precipitation at all. The statewide average for Kansas, 0.03 inch, was only one percent of normal, the lowest average for that state during any month of record except October 1952 which had only 0.02 inch. At Wichita, Kans., a total of 14.35 inches for the period January through November was deficient by 15.25 inches. Kansas City, Mo., had only 0.04 inch in November, the least there for any month on record, and Des Moines, Iowa, had 0.06 inch which tied the record low for November 1904.

Rainfall over southern Alabama, northwestern Florida, and extreme southwestern Georgia, averaging less than an inch (which was also less than 50 percent of normal), caused a continuation of the worst drought on record in that area. The total at Tallahassee, Fla., for January through November was 29.14 inches, the lowest of record for that period; the previous record was 30.22 inches in 1931. For the same period Pensacola, Fla., had 26.11 inches which was 31.32 inches below normal, and Montgomery, Ala., had 22.79 inches, a deficiency of 26.23 inches - record low amounts for both stations.

Monthly totals exceeded an inch east of a line joining San Antonio, Tex., and Sault Ste. Marie, Mich., except for a few southeastern sections and central and southern Illinois, and over 4 inches in the eastern portions of the Middle Atlantic States and southern New England, although amounts were above normal only in the Florida Peninsula, the lower Appalachians, and in the area north and east of a line joining Rochester, New York, and Wilmington, Del. The most notable heavy rainfall in this area occurred at Key West, Fla., where heavy rain, beginning at 2:30 p.m. on the 13th, established the following new station records during subsequent hours: 7.87 inches in 2 hours, 12.85 in 6 hours, 18.17 in 12 hours, and 19.88 inches in 24 hours.

In the Pacific States rains along the Coast ranged up to more than 30 inches in western Washington but tapered off to 1 or 2 inches in southern California. Totals of 1 to over 2 inches for the month also occurred in southern Nevada, central Utah, western Colorado, central and northern Idaho, and extreme western Montana. A record 24-hour amount for November at Salt Lake City, Utah, 1.13 inches, fell on the 16th. In California a period of 196 consecutive days without measurable precipitation at Bakersfield was ended by 0.04 inch on the 11th, and a similar period of 136 days at Burbank was ended on the 10th by 0.35 inch.

SNOWFALL.--November snowfall was unusually light in the Rocky Mountain and Pacific states. The statewide average for Washington, 0.8 inch, was among the lowest on record; only 12 stations in Oregon had measurable amounts; and only a few scattered stations in the Rocky Mountains had over 20 inches, among which were Alta, Utah, with 37 inches. The greatest amounts in New Mexico and Arizona were 4 and 3 inches respectively. Montana and Idaho had statewide averages of 0.7 and 1.6 inches, respectively, both well under 50 percent of normal.

East of the Rocky Mountains total snowfall was above normal in the upper Mississippi Valley, the central Ohio Valley, and inland areas of the Northeast. Most of this snow fell during the opening and closing days of the month. On the 4th depths ranged from 1 to 2 inches over much of Indiana, 1 to 6 inches in central and eastern Kentucky, and 5 to 15 inches in the mountainous areas of Pennsylvania and eastern New York State. This snow melted, except in extreme northern areas, during the following 3 weeks of mild weather. With considerable snow in northern areas near the close of the month, depths at the end ranged up to 3 inches in northeastern North Dakota, northern portions of Minnesota and Wisconsin, and up to 6 inches or more in the Appalachians from western Maryland northward.

TEMPERATURE.--Temperatures for the month averaged below normal in central California and east of a line joining Del Rio, Tex., and Binghamton, N. Y. In the latter area average temperature deficiencies exceeded 2° at nearly all stations east of a line joining New Orleans, La., and Baltimore, Md. Elsewhere, monthly averages were above normal, with departures ranging up to 12° at Glasgow, Mont., and exceeding 6° throughout the northern Great Plains and northern Rocky Mountain region.

The first week was unseasonably cold in the eastern half of the nation and a damaging freeze occurred in the Southeast where many stations reported record lows for so early in the season, among which were Nashville, Tenn., (19°F.); Asheville, N. C., (19°F.); Macon, Ga., (22°F.); Tampa, Fla., (39°F.); Pensacola, Fla., (31°F.); Apalachicola, Fla., (32°F.); and Birmingham, Ala. (21°F).

After the first week unseasonably mild weather prevailed until the last few days of the month. During this period maximum temperatures in the 70's occurred near the Canadian Border in the North-Central Interior. The month's highest temperature, 95°, was recorded in California, at Mecca on the 22d and Elsinore on the 25th.

Cold air again overspread most of the Country during the last 3 days when the month's lowest temperature -20°, was recorded at Tower Falls, Wyo., on the 30th, and subfreezing extended over the Southeast as far south as Tallahassee, Fla.

DESTRUCTIVE STORMS.--November 1954 was notable for the lack of severe storms. One person was killed near San Antonio by lightning on the 9th. Two tornadoes occurred in North Carolina: One on the 2d struck Topsail Island, causing $20,000 damage; the other, believed to be a tornado, destroyed property in rural areas of Cabarrus County on the night of the 28th valued at $20,000. Winds up to 62 m.p.h. damaged property to the extent of $10,000 at Wadena, Minn., on 23d and caused other minor damage over the State. In the Puget Sound area of Washington winds up to 64 m.p.h. caused damage estimated at $25,000.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

NOVEMBER 1954

Section	Temperature								Precipitation					
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes			
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least
	°F.	°F.		°F.			°F.		In.	In.		In.		In.
Alabama	51.5	-2.7	5 Stations	81	12+	Valley Head	11	3	3.08	-0.33	Leeds	6.25	Pushmataha	0.52
Arizona	53.5	3.7	2 Stations	94	10+	2 Stations	8	19+	.12	-.59	Salt River	.90	90 Stations	.00
Arkansas	50.7	-.5	Saint Charles	84	14	Bentonville	14	2	1.37	-2.43	Huttig Dam	4.00	2 Stations	.40
California	53.5	1.5	2 Stations	95	22+	Twin Lakes	-2	30	2.72	.41	Cazadero	14.33	5 Stations	.00
Colorado	39.5	4.6	3 Stations	80	16	Sugarloaf Res	-19	30	.65	-.18	Independence Pass	2.48	Two Buttes 1NW	.00
Connecticut	41.2	.2	Cream Hill	67	17	Falls Village	10	11	6.02	2.15	Round Pond	8.88	Natchaug Ranger Sta.	3.92
Delaware	44.7	-2.0	Selbyville	70	17	Newark College Farm	21	11	4.16	1.15	Lewes	4.73	Selbyville	3.35
Florida	63.0	-1.9	Clewiston U.S. Eng.	89	16	3 Stations	23	3	2.95	.71	Key West WB City	20.98	Raiford State Prison	.19
Georgia	52.4	-2.8	2 Stations	82	13+	Blairsville Exp. Sta.	8	3	3.00	.34	Flat Top	6.22	Blackbeard Island	.25
Idaho	39.9	4.6	Atlanta 1E	75	6	Dixie	-17	30	1.22	-.73	Burke 2NNE	5.39	Three Creek	T
Illinois	43.3	1.1	Harrisburg	76	13	Freeport	11	30	1.23	-1.39	Galesburg	3.31	Mattoon	.27
Indiana	42.5	.3	2 Stations	80	18	Greensburg 3SW	15	30	1.51	-1.51	Kendallville	2.64	Petersburg	.47
Iowa	41.5	4.1	Onawa	79	7	Inwood 2W	9	2	.25	-1.47	Davenport L&D No. 15	.87	Glenwood	.00
Kansas	47.5	3.7	Greensburg	82	6	3 Stations	7	2	.03	-1.36	Mound Valley 3WSW	.57	Numerous Stations	.00
Kentucky	45.1	-1.2	Barbourville	80	17	2 Stations	11	3	1.89	-1.57	2 Stations	3.74	Murray	.43
Louisiana	56.6	-1.8	Vinton	85	13	Tallulah Delta Lab.	20	3	2.51	-2.16	Stevenson Fire D Twr	5.31	Vermillion Lock	.39
Maine	36.7	1.5	2 Stations	63	17+	Greenville	10	16	4.45	.82	West Buxton 2NNW	6.51	The Forks	2.34
Maryland	43.7	-1.5	2 Stations	76	17+	Oakland 1SE	13	1+	2.58	-.17	Elkton	4.13	Rockville	1.48
Massachusetts	41.8	.8	Springfield Armory	69	21	Birch Hill Dam	9	11	5.56	1.84	Willard Brook St. For.	8.71	Taunton	2.87
Michigan	38.6	2.6	South Haven Exp Farm	73	17	Ironwood	13	5	1.78	-.74	Ironwood	3.59	Munising	.65
Minnesota	35.2	5.8	Wheaton	73	10	Detroit Lakes 1NE	-2	30	.58	-.60	Indus	1.94	Glenwood	.08
Mississippi	53.3	-1.7	Collins	87	13	Philadelphia 1WSW	12	3	2.96	-.84	Kosciusko	6.16	Thyatira	.96
Missouri	46.4	1.8	Neosho	80	7	2 Stations	13	3+	.84	-1.89	Gerald	2.54	2 Stations	.00
Montana	40.2	8.3	Miles City	76	6	Wisdom	-19	30	.31	-.47	Summit	3.57	6 Stations	.00
Nebraska	43.1	5.8	McCook	81	7	Scottsbluff WB AP	-3	30	.16	-.61	Hay Springs	1.07	Numerous Stations	.00
Nevada	44.0	3.4	3 Stations	83	1+	Ursine Spring Valley	-13	30	.63	-.01	Adaven	1.94	2 Stations	.00
New Hampshire	37.5	1.9	2 Stations	65	20+	First Conn Lake	9	13+	4.94	1.54	Cannon Mountain	8.53	Whitefield	2.13
New Jersey	43.1	-.9	Chatsworth 5S	72	17	Layton 3NW	10	11	5.27	1.83	Belvidere	8.51	Deepwater	3.29
New Mexico	45.8	2.8	Artesia	85	24	Gobernador 7W	-3	28	.08	-.46	Sandia Crest	.57	95 Stations	.00
New York	38.8	1.1	2 Stations	71	18+	Speculator	3	10+	4.41	1.32	Slide Mountain	9.09	Rushford	.93
North Carolina	47.7	-2.8	2 Stations	82	18	Coweeta Exp. Sta.	7	3	2.89	.09	Mount Mitchell TVA	8.38	Sloan 3S	.93
North Dakota	35.7	8.3	2 Stations	74	6	Cooperstown	-4	30	.21	-.40	Grafton	E1.02	Numerous Stations	T
Ohio	41.8	.2	Chesapeake Huntg. CAA AP	78	17	Kenton 2W	15	2	1.49	-1.20	Willoughby 4N	3.47	Thornville	.05
Oklahoma	52.1	2.2	Oakwood 3SW	86	7	2 Stations	16	2	.24	-1.79	Carnasaw Tower	1.57	Numerous Stations	.00
Oregon	44.1	3.9	Huntington	76	9	Fremont	-12	30	2.57	-1.30	Astor Exp Sta	12.37	Mitchell	.05
Pennsylvania	40.4	-.9	2 Stations	76	17+	Springs 1SW	9	6	2.90	-.10	Matamoras	7.22	Beaver Falls	.52
Rhode Island	43.4	.2	2 Stations	64	20	Kingston	21	8	4.90	1.09	Austin	5.90	Block Island WB AP	4.30
South Carolina	50.9	-2.9	8 Stations	78	12+	Chester 2SW	15	3	2.12	-.21	Caesars Head	6.06	Eutawville	.60
South Dakota	40.5	7.4	Wasta	79	10	Ralph	0	30	.38	-.28	Parkston 5E	1.14	2 Stations	T
Tennessee	46.7	-1.7	Centerville Sub Sta	81	13	Gatlinburg 2SW	3	3	2.32	-1.34	Haw Knob	6.14	Martin Sub Station	.55
Texas	56.1	.4	Mansfield Dam	90	18	Follett	18	2+	1.15	-.69	Richards 1W	5.32	Numerous Stations	.00
Utah	41.2	4.1	Kanab PH	79	10	2 Stations	-10	30	.96	.03	Alta	4.45	2 Stations	T
Vermont	36.8	1.8	2 Stations	69	19+	3 Stations	10	10+	4.53	1.32	Whitingham 3W	9.56	Canaan	2.60
Virginia	43.9	-2.9	Glen Lyn	80	20	Monterey	14	1	2.80	.22	Montebello 3NE	7.59	Sussex	.88
Washington	44.7	4.8	Kosmos	76	1	Republic	11	29	5.44	.76	Forks 1E	31.06	Richland	.60
West Virginia	41.5	-1.7	Brownsville	81	17	Cranberry Glades	8	27	1.86	-.95	Lookout 2	5.04	Brandonville	.83
Wisconsin	36.5	3.5	2 Stations	71	17	Danbury	8	30	.98	-.91	Gurney	4.53	Lancaster	.10
Wyoming	37.7	6.4	Torrington Exp Farm	79	10	Tower Falls	-20	30	.36	-.44	Snake River	1.78	5 Stations	.00
Puerto Rico	75.5	-.5	Coioso	94	16	Garzas Dam	52	30	4.93	-2.07	Maricao (Fish Hatchery)	17.17	Potala	.70

+ And also on a later date or dates

E Water equivalent of snowfall wholly or partly estimated, using a ratio of 1 inch of water equivalent to every 10 inches of new snowfall.

Note: Dates in Table 1 apply to the period 24 hours prior to time of observation. In some cases the actual occurrence is on the calendar date preceding that shown. (See Individual Climatological Data for times of observations).

CLIMATOLOGICAL DATA

Table 2

NOVEMBER 1954

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days: Max. 90° F or above	No. of days: Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	No. of days: .01 inch or more	No. of days: With thunderstorms	Snow, Sleet, Hail: Total	Snow, Sleet, Hail: Max. depth on ground	Average hourly speed	Prevailing direction	Fastest mile: Speed	Fastest mile: Direction	Fastest mile: Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F	°F	°F.	°F.	°F.		°F				°F.	%	In.	In.	In.			In.	In.	M p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
ALABAMA																																
Birmingham	610	993.6	1019.2	62	39	50.7	-1.3	77	13	21	3	0	10	38	67	3.96	-0.02	2.21	7	3	T	T	6.0	NE	47	SW	28	14	6	10	4.5	63
Mobile	10	1010.8	1019.1	67	45	56.4	-2.3	78	12	29	3	0	2	44	71	4.77	.70	2.43	6	3	.0	0	10.8	ENE	---	---	--	16	5	9	4.2	--
Montgomery	198	1011.9	1019.4	65	41	52.8	-2.4	78	13	23	3	0	4	41	70	1.85	-2.10	.63	4	0	.0	0	7.4	NE	38	SW	28	14	6	10	4.4	67
ARIZONA																																
Flagstaff	6993	------	------	57	23	39.6	3.8	69	23	16	6	0	28	--	--	.32	-.57	.15	5	0	1.2	T	----	---	---	---	--	22	4	4	2.6	--
Phoenix	1114	977.0	1016.3	80	49	64.6	6.2	89	11	43	18+	0	0	37	38	T	-.47	T	0	0	.0	0	4.2	E	*25	SSE	1	21	5	4	2.3	96
Prescott	5014	849.3	1019.0	66	33	49.5	3.9	75	23	24	30	0	17	--	--	.11	-.51	.06	3	0	.0	0	5.5	SSW	72	SW	29	20	6	4	2.6	89
Tucson	2558	927.5	1015.9	79	47	62.7	4.5	88	11	35	18	0	0	21	24	.00	-.76	.00	0	0	.0	0	7.0	ESE	31	S	29	26	2	2	1.2	98
Winslow	4880	855.1	1019.5	64	30	46.7	3.8	74	11	23	18+	0	22	19	37	.06	-.37	.06	1	0	.0	0	7.0	SE	*37	NNW	27	20	8	2	2.5	--
Yuma	199	1010.5	1015.8	83	52	67.5	3.3	88	5+	42	30	0	0	32	31	.02	-.12	.02	1	0	.0	0	5.4	N	30	S	11	26	3	1	1.2	97
ARKANSAS																																
Fort Smith	458	1002.4	1019.3	65	39	51.7	1.2	79	17	27	3	0	5	39	67	.59	-2.43	.57	3	1	.0	0	5.6	ENE	26	NW	24	21	6	3	2.9	77
Little Rock	257	1005.8	1019.0	64	42	52.7	1.2	76	8	25	3	0	2	38	63	1.45	-2.47	.73	6	3	T	0	7.4	NW	29	W	24	15	6	9	4.3	70
Texarkana	361	------	------	67	41	54.1	-.7	78	13+	32	5+	0	2	--	--	1.40	-2.93	1.31	4	1	.0	0	----	---	---	---	--	--	--	--	---	--
CALIFORNIA																																
Bakersfield	489	1002.7	1021.1	65	44	54.5	-1.7	83	7	33	27	0	0	43	71	.50	.07	.42	3	0	.0	0	3.8	ENE	*25	NNE	15	12	4	14	5.7	--
Bishop	4108	877.4	1019.6	68	29	48.4	2.2	79	24	12	30	0	25	--	--	.85	.37	.78	2	0	.0	0	----	---	---	---	--	18	5	7	3.4	--
Blue Canyon	5280	841.9	1019.0	55	40	47.6	3.7	69	21	20	30	0	4	--	--	6.68	.00	3.40	8	0	1.1	T	----	---	---	---	--	11	4	15	6.2	--
Burbank	699	991.2	1017.4	76	48	62.4	2.5	90	20	38	30	1	0	42	55	1.37	.39	1.18	3	0	.0	0	4.3	S	*25	NW	16+	16	6	8	3.8	--
Eureka CO	43	1017.6	1020.0	59	48	53.4	2.1	67	7	37	29	0	0	--	--	5.07	.45	1.85	9	0	.0	0	6.3	---	29	S	15	3	5	22	8.1	29
Fresno	331	1008.5	1020.5	62	43	52.4	-1.1	80	6	30	30	0	1	44	79	1.32	.57	.91	2	0	.0	0	4.0	NW	20	SW	10	11	6	13	6.0	54
Los Angeles CO	312	------	------	75	54	64.3	2.2	88	20	46	30	0	0	44	56	2.03	1.00	1.55	6	1	.0	0	6.0	---	31	NE	11	14	8	8	4.0	74
Los Angeles	99	1013.9	1017.5	73	53	62.6	3.3	90	20	43	30	1	0	48	67	1.24	.14	1.15	4	0	.0	0	5.7	W	%40	NE	10	12	8	10	4.6	--
Mt. Shasta	3544	895.7	1021.4	55	33	43.9	2.4	71	1	16	29+	0	14	--	--	7.02	3.19	3.24	8	0	T	T	----	---	---	---	--	6	7	17	6.7	--
Oakland	3	1020.0	1020.5	64	47	55.4	1.6	71	27	34	30	0	0	46	74	1.69	-.26	.70	7	0	.0	0	4.8	SE	*25	SE	8	9	8	13	5.8	--
Red Bluff	341	1007.8	1020.5	62	44	52.7	-1.8	76	5	30	30	0	1	42	72	6.82	4.55	4.00	10	0	.0	0	7.3	WNW	43	SE	15	7	3	20	7.1	48
Sacramento	17	1019.3	1020.2	60	42	51.1	-2.0	73	7	28	30	0	1	44	80	3.01	1.51	1.33	5	0	.0	0	7.0	NW	40	SE	15	9	4	17	6.2	47
Sandberg CO	4517	865.6	1018.0	59	45	51.9	2.4	71	24	28	29	0	2	--	--	1.82	1.12	1.64	4	0	.0	0	----	---	---	---	--	18	5	7	3.1	--
San Diego	19	1013.9	1017.0	73	54	63.7	2.9	86	21	50	26	0	0	48	64	.74	-.09	.73	3	0	.0	0	5.4	N	27	S	11	15	11	4	3.3	75
San Francisco CO	52	------	------	62	51	56.6	-.6	72	27	43	30	0	0	--	--	2.55	.28	1.20	6	0	.0	0	7.0	---	25	S	15	11	8	11	5.4	64
San Francisco	1	1019.0	1019.8	62	45	53.5	-.9	71	5	31	30	0	1	47	81	1.98	.36	.82	7	0	.0	0	7.2	WNW	42	SSW	15	8	9	13	6.2	--
Santa Maria	238	1009.8	1018.6	72	44	58.0	1.6	83	5+	32	30	0	1	42	62	.78	-.16	.53	3	0	.0	0	6.3	WNW	*26	NNE	27	19	3	8	3.6	--
COLORADO																																
Alamosa	7538	774.1	1024.9	55	13	33.9	4.4	64	12+	7	5+	0	30	--	--	.09	-.29	.07	2	0	.4	T	----	---	---	---	--	17	11	2	3.4	--
Colorado Springs	6173	812.4	1021.0	57	28	42.3	3.2	71	16	14	28	0	23	18	44	.23	-.12	.21	2	0	2.2	2	10.3	NNE	*48	NW	27	19	6	5	3.2	--
Denver	5292	839.8	1019.3	58	30	44.3	5.0	72	10+	11	30	0	17	18	42	.57	-.13	.28	4	0	3.9	4	9.8	S	38	NW	26	14	9	7	4.2	79
Grand Junction	4849	864.2	1023.1	54	31	42.6	4.0	64	1	15	30	0	20	28	60	1.69	1.14	.78	6	0	8.7	8	6.9	ESE	54	NW	27	16	7	7	3.9	74
Pueblo	4639	858.8	1019.1	61	28	44.5	5.2	75	16	17	30	0	26	23	49	.23	-.24	.12	4	0	1.3	1	6.8	W	42	N	3	18	6	6	3.2	94
CONNECTICUT																																
Bridgeport	7	1016.9	------	52	37	44.6	1.1	61	20	29	13+	0	8	--	--	7.03	3.44	4.07	11	2	T	0	----	---	---	---	--	9	8	3	6.0	--
Hartford	169	1011.2	1017.2	50	33	41.7	.4	63	21+	22	27	0	15	34	75	4.87	1.39	1.60	13	0	.0	0	9.9	N	37	W	29	6	10	14	6.7	41
New Haven	6	1012.9	1016.9	51	35	43.1	.2	60	20	25	11+	0	13	--	--	4.73	.79	1.84	12	2	T	0	7.7	---	38	E	2	7	8	15	6.4	56
DELAWARE																																
Wilmington	73	1014.9	1017.9	53	35	43.8	-1.7	64	18	24	11	0	14	35	76	4.14	.81	1.53	12	1	T	T	7.4	W	---	---	--	9	7	14	6.1	--
DIST OF COLUMBIA																																
Washington CO	72	------	------	54	38	45.9	-2.1	69	14	28	11	0	3	--	--	1.88	-.94	.51	10	--	T	0	6.7	---	31	W	3	--	--	--	---	--
Wash. Nat'l. AP	14	1014.6	1018.9	53	38	45.2	-2.5	68	14	30	11+	0	8	36	72	1.78	-.95	.53	10	0	.0	0	8.3	SSW	38	NW	29	11	4	15	6.1	48
FLORIDA																																
Apalachicola CO	13	1016.9	1018.0	67	51	58.8	-2.6	72	28+	32	3	0	1	--	--	2.69	.24	1.52	7	2	.0	0	8.0	---	29	E	15	14	7	9	4.5	60
Daytona Beach	31	1016.9	1018.5	72	51	61.6	-3.5	84	16	33	3	0	0	54	80	3.98	1.71	1.60	10	2	.0	0	9.9	NW	*29	ENE	14	15	6	9	4.2	--
Fort Myers	15	1017.3	1017.7	78	57	67.3	-1.9	86	14	47	27+	0	0	58	79	2.33	1.12	.86	7	3	.0	0	8.7	NE	*25	WNW	20	15	10	5	4.0	--
Jacksonville CO	18	------	------	69	51	59.6	-3.1	82	16	30	3	0	1	--	--	1.75	.18	1.29	8	0	.0	0	----	---	---	---	--	--	--	--	---	--
Jacksonville	24	1018.0	1018.8	70	48	59.1	-2.5	83	16	29	3	0	1	48	72	1.68	.06	1.23	7	0	.0	0	9.3	NNE	32	N	11	15	7	8	4.1	62
Key West CO	9	1015.9	1016.3	79	67	73.0	-1.6	85	29+	62	22+	0	0	--	--	20.98	18.96	19.88	5	1	.0	0	7.5	NE	24	NW	20	11	14	5	4.3	66
Lakeland CO	214	------	------	74	56	64.5	-2.2	83	16+	37	3	0	0	--	--	2.10	.71	1.49	9	1	.0	0	6.5	---	---	---	--	14	8	8	4.4	61
Miami CO	8	------	------	77	64	70.3	-2.0	84	5	55	4	0	0	--	--	2.49	.33	2.13	7	2	.0	0	11.7	---	38	SE	14	14	11	5	4.1	76
Miami	8	1015.9	1016.8	79	62	70.8	-1.3	85	29+	53	4	0	0	61	74	4.77	2.36	4.16	7	1	.0	0	9.0	N	*30	E	11	15	9	6	4.2	--
Miami Beach	9	------	------	79	67	72.8	-1.2	85	18	58	7	0	0	--	--	1.33	-.95	1.11	7	0	.0	0	----	N	---	---	--	15	8	7	---	--
Orlando	106	1014.2	1018.5	74	53	63.2	-3.6	85	16	36	3	0	0	54	77	2.68	1.36	1.31	6	1	.0	0	9.1	N	*26	WNW	20	14	8	8	4.1	--
Pensacola CO	13	1016.6	------	67	49	57.9	-2.3	74	28+	31	3	0	1	--	--	1.53	-2.31	1.01	5	1	.0	0	----	---	26	NW	22	--	--	--	---	66
Pensacola CAA AP	118	------	1018.8	--	--	----	----	--	--	--	--	--	--	46	71	----	----	----	--	--	---	--	10.5	NW	---	---	--	--	--	--	---	--
Tallahassee	64	1016.3	1018.5	69	45	56.7	-2.1	79	13	29	3	0	4	45	70	1.20	-1.32	.44	9	1	.0	0	5.8	ENE	---	---	--	13	7	10	4.7	--
Tampa	19	1016.9	1018.4	74	54	63.9	-2.8	81	13	39	3	0	0	55	77	5.38	4.34	3.56	12	1	.0	0	8.1	NE	*23	WNW	20	14	8	8	4.3	67
West Palm Beach	15	1015.9	1016.8	78	61	69.6	-2.1	85	29+	52	27+	0	0	59	75	3.21	.22	1.31	10	2	.0	0	12.0	NW	*29	E	14	14	6	10	4.7	--
GEORGIA																																
Atlanta	977	981.0	1019.9	59	40	49.5	-2.4	74	12	22	3	0	6	38	71	4.12	.71	1.43	10	2	T	0	9.4	NW	42	NW	28	13	6	11	4.8	51
Athens	798	989.2	------	59	39	48.9	-3.1	75	12	19	3	0	7	--	--	4.44	1.42	.97	11	1	T	0	----	---	---	---	--	11	6	13	5.2	--
Augusta	143	1012.5	1019.1	64	38	50.8	-5.1	76	12	22	3	0	11	40	75	2.44	.00	1.01	10	1	.0	0	6.1	NE	*40	W	28	12	4	14	5.4	--
Columbus	385	1005.1	1019.3	64	39	51.6	-2.7	77	28	24	3	0	8	--	--	3.65	.79	1.52	9	2	.0	0	----	---	---	---	--	16	3	11	4.5	--
Macon	356	1004.7	1018.4	65	41	52.9	-3.1	77	13+	22	3	0	5	40	67	3.12	.39	.82	12	1	.0	0	4.9	WNW	38	SW	28	13	6	11	4.9	63
Rome	637	996.3	1020.0	61	34	47.3	-3.2	75	13+	19	3	0	17	--	--	2.22	-1.54	.64	9	0	T	0	----	---	---	---	--	15	4	11	4.7	--
Savannah	48	1016.3	1018.9	67	41	54.1	-4.0	75	19+	24	3	0	7	43	71	2.15	.64	1.49	9	0	.0	0	9.2	NE	32	SW	24	15	5	10	4.5	64
IDAHO																																
Boise	2842	924.8	1022.5	54	33	43.5	3.9	69	8	15	30	0	16	30	64	.94	-.41	.43	4	0	.0	0	8.5	SE	36	NW	27	10	9	11	5.5	61
Idaho Falls 46W CO	4933	852.4	1023.0	51	19	35.1	5.1	63	10	-2	30	0	27	--	--	.65	.09	.51	4	0	.0	0	4.9	---	a24	SW	17	--	--	--	---	--
Idaho Falls 43NW CO	4780	------	------	49	21	35.0	6.1	66	11	1	30	0	27	--	--	.55	.24	.37	4	0	.0	0	5.0	---	a30	NNW	27	--	--	--	---	--
Lewiston	1413	968.5	1021.1	53	35	43.8	3.7	62	7+	20	30	0	10	--	--	.86	-.49	.28	8	0	.0	0	----	---	---	---	--	2	10	18	8.0	--
Pocatello	4444	866.9	1022.9	53	27	40.1	4.2	70	11	9	29	0	22	26	57	.51	-.55	.38	3	0	.0	0	9.9	SW	49	W	27	13	5	12	5.1	73
ILLINOIS																																
Cairo CO	314	1005.4	------	58	41	49.3	.7	74	13	27	2+	0	5	--	--	.70	-3.10	.25	10	1	T	T	7.1	---	28	SW	18	12	9	9	5.1	51
Chicago	610	993.6	1017.1	50	35	42.5	3.0	70	16+	22	30	0	11	33	72	1.80	-.53	.57	11	0	5.7	1	10.6	SSW	27	W	29	8	5	17	6.7	47
Moline	589	995.6	1018.3	50	31	40.7	1.9	71	16	22	5+	0	19	33	76	.75	-1.40	.18	9	0	3.7	2	10.5	NW	34	NW	24	7	6	17	6.7	42
Peoria	654	995.3	1018.1	50	33	41.8	2.1	71	13	22	3	0	15	34	74	2.19	-.16	1.48	11	1	4.0	3	10.8	---	36	NW	24	8	5	17	6.7	41
Springfield	587	994.9	1018.5	52	34	42.9	2.0	71	11	23	3+	0	12	35	75	.82	-1.80	.42	10	1	.9	T	12.4	WNW	35	NW	1+	10	5	15	6.3	50
INDIANA																																
Evansville	383	1003.4	1019.6	57	35	45.9	-.1	74	17	22	30	0	10	37	75	.99	-2.21	.40	8	0	T	T	7.3	WNW	45	W	24	9	8	13	5.9	50
Fort Wayne	801	985.4	1017.2	49	33	40.7	1.0	68	17	22	30	0	17	35	82	2.18	-.28	.56	10	0	4.6	2	11.0	W	36	W	29	7	8	15	6.8	44
Indianapolis	733	988.8	1018.4	51	33	42.1	.6	69	16	22	30	0	16	36	80	1.32	-1.81	.32	10	0	5.0	1	10.0	W	34	NW	28	11	1	18	6.2	47
South Bend	768	988.5	1017.1	49	33	40.7	2.0	68	17	23	2+	0	17	35	81	2.23	-.51	.70	15	0	4.9	2	7.8	SW	*19	W	28+	7	4	19	7.1	--

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
IOWA																																
Burlington	694	992.2	1018.6	52	32	42.1	2.6	72	11	19	5	0	17	32	72	0.78	-1.48	0.37	8	0	0.6	T	10.8	NW	49	NW	24	8	7	15	6.1	65
Des Moines	948	986.8	1018.6	53	32	42.5	4.1	73	7	19	2	0	15	31	67	.06	-1.62	.03	3	0	T	T	14.5	NW	61	NW	24	7	15	8	5.7	67
Dubuque	1065	977.3	1019.4	47	29	38.2	2.6	67	16+	17	30	0	20	30	72	.47	-1.66	.23	6	0	2.5	1	----	---	---	---	--	7	8	15	6.4	--
Sioux City	1094	975.6	1018.0	54	31	42.7	7.2	77	7	16	2	0	18	30	64	.26	-.94	.21	2	0	2.0	2	14.2	NNW	59	NW	24	9	12	9	5.2	70
KANSAS																																
Concordia CO	1375	968.2	------	60	35	47.4	5.3	75	7	16	2	0	12	--	51	.01	-1.14	.01	1	0	T	0	7.8	---	31	NW	24	14	11	5	3.4	70
Dodge City	2594	929.6	1018.6	62	35	48.2	5.5	75	6+	16	2	0	12	28	52	T	-.87	T	0	0	T	T	16.2	SSW	49	N	26	18	6	6	3.2	85
Goodland	3645	889.6	1018.5	58	27	42.5	5.0	75	6+	12	29	0	26	23	52	.06	-.52	.06	1	0	.6	1	10.5	NNW	*25	NNW	26	16	9	5	3.6	--
Topeka	879	982.7	1019.2	60	34	47.3	4.7	77	11	19	2	0	13	32	59	T	-1.59	T	0	0	T	0	10.4	NW	40	NW	24	15	9	6	4.0	70
Wichita	1321	969.2	1018.7	62	36	49.2	4.1	78	7	19	2	0	10	32	55	T	-1.73	T	0	0	.0	0	12.4	S	38	N	26+	17	4	9	3.8	85
KENTUCKY																																
Lexington	979	982.4	1018.8	53	36	44.6	.8	72	17	22	2	0	1	36	77	2.36	-.79	.58	10	0	2.2	1	11.0	SSE	---	---	--	6	8	16	6.6	--
Louisville CO	457	------	------	55	40	47.8	1.1	73	17	26	2	0	3	--	--	1.04	-2.04	.26	8	0	T	0	----	---	---	---	--	--	--	--	---	--
Louisville	474	1001.7	1018.5	55	37	46.1	.4	73	17+	24	2	0	7	38	76	1.16	-1.96	.32	10	0	T	0	7.0	SE	34	W	24	7	9	14	6.3	44
LOUISIANA																																
Baton Rouge	64	1015.6	1018.6	69	46	57.7	-1.4	80	28	33	6	0	0	45	68	1.92	-2.81	1.47	4	3	.0	0	8.4	ENE	---	---	--	16	8	6	4.0	--
Lake Charles	12	1018.0	1019.0	70	48	59.0	-.3	79	28	38	6	0	0	45	66	4.25	-.09	3.06	5	1	.0	0	7.8	NW	*22	NNE	2	15	7	8	4.3	--
New Orleans CO	9	1016.9	------	68	53	60.4	-2.1	78	27+	38	3	0	0	--	--	2.88	-1.13	1.73	4	1	.0	0	7.1	---	19	E	12	14	10	6	4.0	67
New Orleans	3	1016.6	1018.8	69	49	59.7	-2.2	78	28	37	6	0	0	49	73	2.04	-2.05	1.58	4	1	.0	0	9.9	ENE	*30	SW	28	13	12	5	4.1	--
Shreveport	252	1009.5	1019.1	68	43	55.3	-.1	79	13	34	29	0	0	43	69	4.24	.34	2.85	4	1	.0	0	9.7	WNW	---	---	--	22	5	3	2.5	88
MAINE																																
Caribou	624	992.2	1016.0	39	27	32.7	3.5	58	21	17	27+	0	26	26	78	3.02	-.01	.89	13	0	7.2	5	11.2	WNW	*40	W	15	3	4	23	8.5	--
Portland	61	1012.9	1016.8	47	30	38.6	1.1	58	20	20	10	0	22	32	79	5.36	1.57	1.78	10	0	1.8	1	10.0	N	50	E	29	7	9	14	6.5	54
MARYLAND																																
Baltimore CO	14	------	------	54	40	47.1	-1.6	70	14	34	11	0	0	--	--	2.67	-.29	.79	12	--	---	--	----	---	---	---	--	--	--	--	---	--
Baltimore	146	1014.2	1018.8	52	35	43.4	-2.2	68	14	25	7+	0	16	35	74	2.42	-.54	.75	13	0	T	0	8.5	W	57	W	3	10	6	14	5.9	46
Frederick	294	------	------	51	32	41.6	-3.8	70	14	20	11	0	21	--	--	1.78	-1.17	.75	12	--	2.0	T	----	---	---	---	--	--	--	--	---	--
MASSACHUSETTS																																
Blue Hill Obs.	629	992.8	1016.7	49	34	41.3	.6	63	20+	23	13	0	15	--	76	4.72	.52	1.80	12	0	.1	T	15.4	NNW	45	S	21	8	11	11	6.1	51
Boston	15	1012.5	1017.0	51	37	44.4	.0	66	20	28	13+	0	4	35	71	5.52	2.03	1.93	15	0	T	T	15.0	SW	*49	ESE	3	9	9	12	6.1	62
Nantucket	43	1016.3	1016.8	52	40	45.8	1.3	63	17	26	10	0	4	40	77	4.48	.76	1.20	14	2	.0	0	14.6	WSW	56	SE	3	3	10	17	7.3	45
Pittsfield	1153	962.1	------	46	29	37.3	.4	61	20	16	11	0	25	--	--	5.89	1.91	2.07	14	--	8.2	2	----	---	---	---	--	--	--	--	---	--
MICHIGAN																																
Alpena CO	587	992.9	------	44	34	39.1	2.9	57	11	26	10	0	10	--	--	2.39	.21	.63	12	0	.4	T	10.4	---	33	NW	14+	2	6	22	8.3	29
Detroit	619	989.8	1016.9	48	35	41.2	1.1	65	17	29	15	0	11	35	78	1.41	-.77	.32	13	0	.7	1	9.5	S	30	W	29	7	7	16	6.7	41
Detroit (Willow Run)	722	987.8	1016.7	48	33	40.7	1.0	66	17	25	1	0	13	34	79	1.48	-.72	.28	11	0	2.9	1	9.7	SW	*25	SSE	1+	5	10	15	6.8	--
East Lansing CO	856	------	------	48	33	40.3	2.4	69	17	23	23	0	15	--	--	1.97	-.33	.78	11	0	2.1	1	4.8	---	13	SE	1+	--	--	--	---	34
Escanaba CO	594	992.2	------	44	33	38.4	4.5	58	11	26	23+	0	16	--	--	.90	-1.30	.40	6	0	.6	1	10.7	---	37	SE	23	1	6	23	8.4	24
Grand Rapids	681	990.5	1016.4	48	32	39.9	2.3	69	17	23	23	0	19	34	81	1.62	-.91	.53	12	0	3.2	T	8.2	SSW	26	W	3	5	5	20	7.5	40
Marquette CO	677	987.1	------	43	33	37.8	3.9	57	7+	26	30	0	12	--	73	1.32	-1.80	.30	17	0	8.0	2	8.7	---	37	S	13	0	4	26	9.2	26
Muskegon	627	992.6	1016.3	48	33	40.5	2.0	64	17	23	15	0	17	34	78	2.10	-.54	.44	14	0	7.7	1	----	---	---	---	--	5	2	23	7.8	--
Sault Ste. Marie	721	992.6	1015.8	42	31	36.2	4.7	54	13	24	25+	0	21	31	82	1.55	-1.71	.40	12	0	7.0	1	8.9	SE	28	SW	11	1	3	26	9.0	23
MINNESOTA																																
Duluth	1409	972.9	1015.4	39	25	32.0	5.0	60	7	12	30	0	28	26	81	.79	-.99	.43	9	0	7.4	3	13.6	NNW	38	NW	1+	2	3	25	8.6	32
Intern'l Falls	1179	970.9	1015.2	37	22	29.6	5.6	60	10	10	14	0	30	25	79	1.38	.21	.47	15	0	12.8	8	10.1	---	---	---	--	3	1	26	8.8	--
Minneapolis	830	982.7	1017.0	46	31	38.3	5.3	66	10	20	30	0	16	29	72	.61	-.83	.29	7	0	6.4	4	12.0	NNW	45	NW	23	4	8	18	7.3	41
Rochester	1017	978.7	1016.9	45	28	36.8	4.3	65	7+	14	30	0	24	22	57	.90	-.62	.50	5	0	7.2	5	11.5	NW	---	---	--	4	9	17	7.1	--
St. Cloud	1034	977.3	1016.3	44	26	35.0	5.6	65	10	14	30	0	25	27	75	.38	-.99	.18	4	0	3.2	2	8.0	NW	---	---	--	3	7	20	7.7	--
MISSISSIPPI																																
Jackson	315	1007.1	1018.9	66	42	54.0	-1.2	80	13	25	3	0	4	40	65	2.47	-1.58	1.40	9	0	.0	0	7.5	NW	32	SW	28	15	8	7	3.9	70
Meridian	294	1005.1	------	67	40	53.1	-1.0	79	13	19	3	0	7	--	--	2.12	-1.91	.80	5	0	.0	0	----	---	---	---	--	16	7	7	3.6	--
Vicksburg CO	234	1010.2	------	66	47	56.1	-.7	78	13	30	3	0	1	--	--	2.18	-2.43	1.10	8	1	.0	0	8.6	---	28	SW	28	14	8	8	4.1	71
MISSOURI																																
Columbia	778	989.5	1018.4	56	36	46.0	2.8	73	8+	22	3	0	9	33	64	.58	-2.03	.33	5	1	T	0	10.0	NW	37	NW	24	13	9	8	4.5	65
Kansas City	741	983.7	1019.0	59	39	48.9	4.6	76	7	23	2	0	7	33	56	.04	-2.13	.02	2	0	T	0	9.1	S	33	NW	1	14	9	7	4.2	68
St. Joseph	809	------	------	58	34	45.9	3.6	75	11	21	2	0	14	--	--	.06	-1.94	.05	2	0	T	T	----	---	---	---	--	--	--	--	---	--
St. Louis CO	465	998.0	------	55	40	47.4	1.4	74	13	24	2	0	8	--	--	1.37	-1.35	.75	8	1	1.0	1	10.3	---	34	W	24	11	4	15	5.9	51
St. Louis	552	998.0	1018.6	55	37	45.9	.9	74	13	23	2	0	9	35	66	1.19	-1.38	.63	7	1	T	T	8.7	NW	---	---	--	7	10	13	6.2	--
Springfield	1265	970.5	1018.8	57	37	46.8	2.3	73	8	21	2	0	11	36	69	1.02	-1.73	.72	5	1	T	T	12.6	SSE	45	SE	30	14	13	3	3.9	76
MONTANA																																
Billings	3568	893.0	1018.4	55	33	43.9	8.1	67	6	13	30	0	16	27	53	T	-.68	T	0	0	T	T	12.2	WSW	56	W	25	7	10	13	6.1	52
Glasgow CO	2090	941.4	1017.3	54	29	41.2	12.4	70	6	16	29	0	22	28	62	.12	-.40	.10	4	0	.2	T	----	---	---	---	--	7	9	14	6.3	--
Great Falls	3664	889.3	1017.4	54	36	44.7	9.5	68	22	13	30	0	8	27	52	.02	-.65	.02	1	0	.2	T	18.4	SW	58	SW	25	6	10	14	6.6	49
Havre CO	2488	926.9	1017.3	54	31	42.3	11.4	70	6+	9	30	0	19	--	--	.13	-.35	.11	3	0	.3	T	9.3	---	35	SW	19	6	8	16	7.0	35
Helena	3893	876.1	1021.1	51	27	39.1	7.4	68	22	-8	30	0	19	27	67	.48	-.16	.48	1	0	9.7	9	6.9	W	43	SW	25	6	13	11	5.9	63
Kalispell	2965	------	------	45	31	37.9	5.9	54	21	13	30	0	18	--	--	.87	-.68	.27	13	0	2.2	2	----	---	---	---	--	3	4	23	8.4	--
Miles City	2629	933.0	1018.5	54	29	41.5	8.7	72	5+	12	30	0	20	28	--	.14	-.35	.11	3	0	1.2	1	8.8	NW	---	---	--	7	12	11	5.8	--
Missoula	3200	905.9	1022.8	49	28	38.5	6.6	59	22+	12	30	0	20	31	77	.23	-.88	.08	8	0	T	T	3.4	W	30	NW	25	7	5	18	6.8	59
NEBRASKA																																
Grand Island	1841	950.9	1018.3	57	30	43.5	5.9	78	7	8	2	0	20	28	59	.02	-.96	.02	1	0	T	T	11.4	S	---	---	--	14	8	8	4.1	--
Lincoln CO	1184	------	------	56	34	45.2	4.9	74	7	17	2	0	13	--	--	.01	-1.40	.01	1	0	T	0	9.4	---	36	NW	23	12	12	6	4.4	76
Norfolk	1544	961.4	1018.4	55	30	42.6	7.7	77	7	11	2	0	18	30	63	.10	-.96	.05	2	0	.6	1	----	---	---	---	--	14	8	8	4.5	--
North Omaha	1323	969.2	------	55	33	43.7	----	74	7	15	2	0	16	--	--	.06	-----	.03	3	0	.2	T	----	---	---	---	--	--	--	--	---	--
North Platte	2779	917.4	1018.4	57	23	40.3	3.5	76	7	7	2	0	27	27	65	.06	-.49	.05	2	0	.8	1	11.9	NW	51	NW	26	9	15	6	4.9	72
Omaha	978	977.7	1018.4	57	35	45.7	6.8	75	7	19	2	0	12	32	63	.04	-1.25	.02	2	0	T	0	12.0	SSE	46	NW	23	12	12	6	4.4	70
Scottsbluff	3950	801.1	1019.7	56	24	40.2	4.1	74	6+	-3	30	0	28	24	58	.30	-.27	.30	2	0	4.2	4	10.9	WNW	---	---	--	11	9	10	5.1	--
Valentine CO	2581	924.5	------	55	28	41.8	6.5	75	16	8	2	0	21	--	--	.48	-.16	.43	5	0	8.9	9	9.3	---	38	NW	23	15	7	8	4.5	77
NEVADA																																
Elko	5075	849.6	1023.8	56	21	38.6	4.1	67	1+	3	30	0	28	23	59	.72	-.21	.55	2	0	T	0	4.7	ENE	*29	SSW	11+	12	7	11	5.1	--
Ely	6257	813.1	1023.1	54	24	38.8	3.6	68	25	-1	30	0	28	24	63	1.12	.43	.78	6	0	3.8	3	13.5	---	51	S	11	13	10	7	4.5	76
Las Vegas	2162	952.3	1017.9	71	43	57.2	3.3	79	27	29	30	0	1	26	35	.36	.14	.34	3	0	.0	0	6.6	W	*40	NNW	29	18	10	2	3.2	79
Reno	4397	866.2	1022.1	59	24	41.4	1.2	70	5	9	30	0	27	26	58	.74	.10	.74	1	0	T	T	4.0	S	40	S	14	13	5	12	5.1	80
Winnemucca	4299	872.0	1022.8	59	19	39.3	1.7	71	5	-5	30	0	27	21	54	.17	-.67	.12	2	0	T	0	6.3	---	27	W	12	9	10	11	5 -	71
NEW HAMPSHIRE																																
Concord	339	1005.8	1016.8	48	28	38.0	1.3	63	21	13	11	0	23	30	76	4.45	.88	1.34	12	0	.5	T	5.9	NW	47	NE	3	6	8	16	6.7	40
Mt. Washington	6262	800.7	------	26	14	19.9	.0	46	21+	-2	13	0	28	--	85	8.97	2.39	2.03	21	1	36.1	8	34.3	W	*123	ESE	3	6	3	21	7.6	31

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M p. h.			0–3	4–7	8–10	0–10	%
NEW JERSEY																																
Atlantic City CO	8	1015.9	1018.0	53	40	46.8	-1.3	64	12	33	27+	0	0	--	--	4.04	0.72	1.77	14	1	0.0	0	14.9	---	60	SE	2	11	6	13	5.4	59
Newark	11	1015.9	1017.6	53	37	44.8	-.1	63	20	28	11	0	9	35	70	4.79	1.69	1.52	12	0	T	T	9.9	NNE	•39	W	29	9	7	14	6.0	--
Trenton CO	56	1010.5	1017.6	51	37	44.3	-1.3	63	20	29	11	0	4	--	--	4.30	1.44	2.23	11	0	.0	0	8.3	---	•34	W	29	10	6	14	5.5	55
NEW MEXICO																																
Albuquerque	5310	851.3	1018.4	62	35	48.7	4.7	70	1	26	29	0	5	24	41	.22	-.20	.22	1	0	.0	0	7.8	N	40	E	1+	24	3	3	1.9	93
Clayton	4969	847.3	1019.1	61	32	46.3	3.9	76	6	19	2	0	16	--	--	T	-.39	T	0	0	T	0	----	---	---	---	--	18	10	2	2.8	--
Roswell	3612	896.0	1018.9	68	32	50.1	1.8	82	23	27	7+	0	18	26	43	T	-.39	T	0	0	.0	0	8.0	---	42	NW	26	23	6	1	2.0	--
NEW YORK																																
Albany	277	1013.2	1016.7	48	32	39.7	.7	63	20	17	13	0	18	33	79	4.00	1.31	1.64	12	1	1.8	2	7.1	S	38	W	21+	5	4	21	7.3	36
Binghamton	1601	956.3	1016.5	43	31	37.0	-.2	59	18	21	6	0	24	31	80	5.08	2.23	2.08	12	0	24.4	9	11.1	WNW	42	NW	4	4	4	22	7.8	33
Buffalo	693	988.2	1016.9	48	35	41.7	1.8	69	18+	27	13	0	10	33	74	3.32	.23	.97	14	0	.7	1	12.3	S	40	W	29	4	5	21	7.7	32
New York CO	10	1005.1	------	52	40	45.9	-.4	66	20	33	10	0	0	--	--	4.60	1.51	1.56	12	1	.0	0	11.5	---	59	W	29	11	8	11	5.4	59
New York	19	1015.9	1017.6	53	41	46.9	.1	64	20	32	10	0	1	36	68	5.97	2.98	1.94	13	1	.0	0	11.8	SW	42	W	29	8	8	14	6.1	--
Rochester	543	997.0	1016.4	49	34	41.3	1.6	69	18	25	15+	0	13	33	76	2.51	-.23	1.10	14	0	.1	T	8.4	S	40	SW	14	4	6	20	7.7	38
Schenectady	217	------	------	48	34	40.9	2.3	64	20	23	13	0	13	--	--	4.48	1.64	1.78	11	1	.9	1	----	---	---	---	--	10	9	11	5.9	--
Syracuse	424	994.9	1017.6	48	34	40.9	-.3	67	18	23	13+	0	14	33	75	4.84	1.71	1.45	13	0	6.9	3	9.0	ESE	38	NW	4	4	5	21	7.7	31
NORTH CAROLINA																																
Asheville CO	2203	------	------	53	33	43.2	-3.4	69	9	19	3	0	16	--	--	2.84	.73	.93	9	1	.8	1	7.0	---	34	SE	27	9	8	13	5.5	59
Asheville	2093	943.8	1020.0	--	--	----	---	--	--	--	--	--	--	33	79	----	----	----	--	--	---	--	3.6	NNW	--	---	--	--	--	--	---	--
Charlotte	753	991.2	1019.3	59	38	48.4	-2.0	75	12	24	3	0	12	38	72	2.44	-.21	1.06	11	1	T	0	8.0	NE	43	N	3	9	6	15	5.8	51
Greensboro	891	987.1	1019.8	54	35	44.6	-3.4	70	19+	23	27	0	14	36	77	3.43	.72	1.20	12	1	T	0	7.0	NE	31	WNW	2	8	8	14	6.2	69
Hatteras	4	1017.6	1018.0	62	51	56.1	-1.2	72	19+	40	3	0	0	48	76	4.83	.98	1.29	9	3	.0	0	12.0	NW	40	SW	29	13	6	11	4.9	57
Raleigh	438	1003.1	1019.0	58	36	47.1	-3.3	71	18+	24	27	0	11	38	76	2.53	-.32	.80	12	2	T	0	6.8	NNE	---	---	--	9	8	13	5.8	61
Wilmington	30	1017.6	1019.0	65	42	53.4	-2.3	79	19	26	27	0	4	--	--	1.76	-.83	.57	8	1	.0	0	8.7	---	42	SW	29	13	8	9	4.6	67
Winston-Salem	967	983.7	1019.5	54	36	45.1	-3.5	71	12	24	3	0	14	35	73	3.74	.95	.82	12	0	.4	T	7.9	NE	•29	SSW	1	8	9	13	6.0	--
NORTH DAKOTA																																
Bismarck	1650	957.3	1017.4	49	24	36.4	8.0	72	6	3	30	0	25	27	72	.09	-.44	.04	6	0	.5	T	10.7	WNW	50	NW	23	8	8	14	6.3	63
Devils Lake CO	1471	961.1	------	42	25	33.4	8.3	62	6	8	30	0	27	--	--	.37	-.30	.22	5	0	2.3	2	9.1	---	32	NW	23	4	11	15	6.9	45
Fargo	895	981.7	1016.6	44	25	34.5	6.9	68	10	3	30	0	25	25	71	.17	-.70	.06	6	0	1.1	1	16.2	NNW	50	NW	23	3	11	16	7.4	51
Williston CO	1877	947.9	1016.8	50	28	39.0	10.7	69	6	10	1	0	18	30	72	.15	-.43	.06	5	0	.9	1	7.3	---	31	NW	26	6	5	19	7.1	55
OHIO																																
Akron	1210	979.7	1018.3	40	33	40.3	-.1	70	18+	25	1	0	20	32	78	1.08	-1.30	.27	12	0	1.3	T	10.5	SW	---	---	--	7	8	15	6.7	--
Cincinnati Obs.	761	------	------	52	36	44.3	-.3	72	17	27	30	0	8	--	--	1.56	-1.50	.57	8	2	.3	T	5.9	---	22	W	28	--	--	--	---	42
Cincinnati	869	985.8	1018.4	52	35	43.6	.2	72	17	23	30	0	10	35	73	1.33	-1.70	.38	9	1	1.9	T	8.6	SSW	•25	SSW	23	7	4	19	7.0	--
Cleveland CO	663	------	------	50	38	44.1	.3	72	18	30	2+	0	3	--	--	.79	-1.90	.27	8	--	---	--	----	---	---	---	--	--	--	--	---	--
Cleveland	787	989.5	1017.4	50	35	42.6	.9	72	17	25	1	0	15	35	77	1.34	-1.32	.26	14	0	.2	1	10.7	S	35	NW	3	6	8	16	7.0	35
Columbus CO	724	------	------	51	38	44.2	1.0	73	17	26	2	0	4	--	--	.87	-1.67	.17	11	--	1.2	T	----	---	---	---	--	--	--	--	---	--
Columbus	815	988.2	1018.5	51	34	42.5	.6	73	18	25	11+	0	15	35	78	1.08	-1.78	.27	13	0	1.9	T	8.5	SSE	33	WSW	29	7	6	17	6.6	43
Dayton	1002	981.0	1018.1	50	34	42.1	.2	70	17	20	2	0	13	35	79	1.12	-1.49	.40	8	0	2.8	1	8.8	S	37	W	29	8	4	12	6.7	45
Portsmouth CO	715	------	------	53	31	41.9	-2.1	73	18	22	2	0	21	--	--	1.91	-.73	.86	11	0	4.1	1	4.0	---	%32	WNW	29	--	--	--	---	--
Sandusky CO	603	994.6	------	49	36	42.5	.3	71	18	27	1	0	6	--	--	1.44	-.83	.61	10	0	T	T	6.3	---	30	SW	29	9	7	14	6.2	49
Toledo	622	993.6	1017.3	49	33	40.9	1.1	70	18	24	1	0	15	35	82	1.37	-.78	.26	10	0	1.9	1	9.9	SSW	31	SW	29	7	7	16	6.9	35
Youngstown	1178	974.6	1018.0	48	32	40.1	-.5	70	17	23	1	0	23	33	79	1.80	-1.69	.34	16	0	4.9	1	10.8	SW	•40	WNW	3	7	5	18	6.8	--
OKLAHOMA																																
Oklahoma City	1280	975.3	1019.5	65	38	51.7	2.7	81	6	24	2	0	5	31	52	.10	-1.72	.10	1	1	.0	0	11.1	NNW	40	SE	30	21	3	6	2.8	81
Tulsa	672	994.2	1018.8	65	40	52.6	3.0	78	7	25	2	0	4	35	55	.26	-2.14	.26	1	0	.0	0	10.1	SSE	32	NW	24	18	9	3	3.3	83
OREGON																																
Astoria	12	1016.9	1018.0	57	44	50.6	3.5	66	21	31	30	0	2	48	89	10.10	2.56	1.81	22	1	T	0	6.6	SE	---	---	--	2	6	22	8.4	--
Burns CO	4140	876.7	1021.7	55	28	41.1	4.6	69	5	5	30	0	26	26	61	.95	-.22	.43	6	0	T	0	----	---	---	---	--	8	6	16	6.3	--
Eugene	361	1006.1	1019.9	56	43	49.5	4.2	70	4	28	30	0	1	--	--	4.66	-1.03	1.58	16	0	.0	0	----	---	---	---	--	0	6	24	8.6	--
Meacham	4050	------	------	48	33	40.7	5.8	62	22	14	30	0	12	--	--	2.20	-1.97	.61	14	0	1.1	1	----	---	---	---	--	5	2	23	7.8	--
Medford	1312	972.6	1020.8	56	36	46.0	1.8	71	1	20	30	0	9	38	79	.68	-1.99	.39	9	0	.0	0	2.8	SSE	•30	SSE	8	2	9	19	7.9	--
Pendleton	1492	966.1	1020.7	54	38	46.4	5.3	69	22	24	30	0	6	38	73	1.21	-.30	.45	10	0	.0	0	7.6	SE	---	---	--	5	7	18	7.4	--
Portland	22	1013.5	1019.3	56	44	49.7	4.2	69	1	30	30	0	1	46	85	5.09	-.13	.95	18	0	.0	0	7.3	ESE	38	S	15	1	4	25	8.8	18
Roseburg	505	1001.0	1020.0	57	40	48.6	---	69	4	23	30	0	3	--	--	2.40	-2.11	.59	15	0	.0	0	3.4	---	18	S	13+	0	6	24	8.6	28
Salem	195	1011.9	1019.3	56	42	49.0	3.6	69	1	29	30	0	2	45	88	5.07	-.89	1.11	20	0	.0	0	7.0	S	---	---	--	1	3	26	9.0	--
Sexton Summit	3836	------	------	51	39	44.9	3.7	65	23	24	29+	0	4	--	--	3.48	-1.06	1.04	12	0	T	T	----	---	---	---	--	3	12	15	7.4	--
PENNSYLVANIA																																
Allentown	376	1003.7	1018.3	50	32	40.7	-1.3	64	18	19	11	0	20	34	79	4.35	1.28	1.43	12	0	T	0	9.0	W	---	---	--	9	5	16	6.3	--
Harrisburg	335	1004.7	1018.7	50	35	42.4	-1.6	61	20+	23	11	0	11	32	70	2.53	-.20	.81	11	0	1.8	T	6.4	W	34	NW	29	8	5	17	6.7	42
Philadelphia CO	26	------	------	53	40	46.4	-1.4	64	20+	33	10	0	0	--	--	4.05	.97	1.76	12	0	T	T	7.6	---	24	NW	29	9	9	12	5.8	44
Philadelphia	13	1013.5	1017.8	54	37	45.4	-.5	65	20+	27	11	0	6	37	76	3.87	.79	1.18	13	0	.0	0	9.2	WNW	•42	WNW	29	8	8	14	6.1	--
Pittsburgh CO	749	------	------	51	37	44.3	-.3	72	17	30	11	0	8	--	--	.96	-1.65	.20	12	--	.4	--	----	---	---	---	--	--	--	--	---	28
Pittsburgh	1151	987.8	1018.2	49	34	41.5	.5	71	17	26	1	0	16	33	73	1.00	-1.59	.18	14	0	1.0	T	10.8	WSW	•30	W	29+	7	4	19	6.8	41
Reading CO	266	1005.8	1018.0	51	37	43.8	-1.6	64	18	26	11	0	8	--	--	4.37	1.32	1.28	13	1	T	T	8.7	---	43	W	29	8	4	18	6.5	45
Scranton CO	746	987.8	1017.6	48	35	41.4	-.5	64	20+	23	13	0	13	--	--	4.70	1.80	1.48	13	0	4.4	1	5.7	---	24	NW	3	7	5	18	7.0	37
Williamsport	527	998.3	1018.0	49	33	40.6	-1.1	65	18	20	11	0	18	--	--	3.03	-.23	1.04	15	--	6.5	4	----	---	---	---	--	6	5	19	7.1	--
RHODE ISLAND																																
Block Island	110	1012.2	1016.5	52	40	45.7	.4	61	21+	31	13	0	2	--	--	4.30	.77	1.14	12	1	T	T	----	---	---	---	--	5	10	15	6.6	--
Providence	55	1011.2	1017.1	51	34	42.9	.3	64	20	25	27+	0	15	34	73	4.92	1.18	1.35	13	1	.0	0	10.9	SW	•37	WSW	29	10	8	12	5.8	53
SOUTH CAROLINA																																
Charleston CO	9	------	------	65	48	56.5	-2.1	71	18+	28	3	0	1	--	--	1.49	-.43	.84	8	0	.0	0	10.1	---	33	NW	2	13	7	10	4.7	73
Charleston	41	1017.3	1018.8	67	43	54.6	-1.7	76	18	27	3	0	7	43	72	1.12	-.93	.55	9	0	.0	0	9.1	NNE	---	---	--	13	8	9	4.8	--
Columbia	217	1010.5	1019.0	63	38	50.4	-3.5	75	12	24	27	0	12	41	77	1.92	-.33	.47	12	0	.0	0	5.9	NE	•29	SSW	28	13	7	10	4.9	62
Florence	146	1013.2	1019.0	64	41	52.2	-1.4	77	19	27	27+	0	7	--	--	.81	-1.47	.37	7	0	.0	0	----	---	---	---	--	13	7	10	4.9	--
Greenville	1018	980.7	1018.7	57	39	47.7	-3.6	73	12	19	3	0	7	36	69	3.08	.04	.86	10	1	T	0	8.4	NE	38	W	2	12	5	13	5.4	62
Spartanburg	801	------	------	57	39	47.8	-3.4	73	12	26	3	0	8	--	--	4.15	1.18	1.29	12	0	T	T	----	---	30	NW	2	12	6	12	5.2	--
SOUTH DAKOTA																																
Huron	1282	969.2	1017.3	52	26	39.3	6.8	72	10	9	2	0	25	29	69	.43	-.23	.35	2	0	4.3	4	12.0	S	73	NW	23	9	8	13	5.8	66
Rapid City	3165	902.8	1018.4	55	30	42.6	7.3	75	6	13	30	0	17	26	57	.64	.09	.60	5	0	7.3	7	11.0	NW	42	W	26	8	13	9	5.4	62
Sioux Falls	1420	964.4	1017.4	52	28	39.9	7.7	71	7	10	2	0	25	27	62	.72	-.39	.68	3	0	7.8	8	12.4	NW	•52	NW	23	9	13	8	5.5	--
TENNESSEE																																
Bristol	1519	963.8	------	54	34	44.1	-1.7	73	19+	24	27+	0	14	--	--	2.42	-.14	.72	15	0	2.3	1	----	---	---	---	--	10	5	15	6.1	--
Chattanooga	670	991.5	1019.6	59	35	47.2	-1.9	74	14+	19	3	0	13	37	75	5.06	1.03	2.50	7	1	T	0	3.5	NW	30	[illegible]	1	11	5	14	5.8	56
Knoxville	950	983.4	1019.5	56	36	46.1	-2.3	73	14	17	3	0	10	36	73	3.40	.25	1.63	10	1	T	0	5.9	NE	30	SW	1	9	4	17	6.0	45
Memphis CO	271	------	------	61	44	52.6	.5	77	13	28	2	0	2	--	--	.81	-3.50	.27	8	--	.0	0	----	---	---	---	--	--	--	--	---	--
Memphis	263	1004.1	1019.1	63	38	50.4	-.2	78	13	20	3	0	11	38	67	1.06	-3.50	.41	8	2	.0	0	8.2	NE	29	NW	24	15	6	9	4.4	75
Nashville	577	999.0	1019.3	59	38	48.2	-1.1	76	14+	19	3	0	8	39	75	1.12	-2.29	.33	9	1	1.0	T	5.7	SSE	26	W	24	10	12	8	5.0	59
Oak Ridge	905	985.4	------	56	33	44.8	-.6	72	17	17	3	0	14	--	--	2.49	-1.49	.65	10	2	.2	T	3.5	---	22	W	24	11	3	16	6.2	--

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature								No. of days				Precipitation			No. of days		Snow, Sleet, Hail		Wind		Fastest mile			No. of days (sunrise to sunset)				
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
TEXAS																																
Abilene	1759	957.3	1018.6	68	43	55.6	1.9	82	23	33	29	0	0	38	57	1.65	0.63	1.54	3	2	0.0	0	11.8	S	46	SE	29	18	7	5	2.9	86
Amarillo	3590	891.3	1018.1	66	35	50.5	5.3	80	16	24	2+	0	9	25	42	T	-.88	T	0	0	.0	0	12.8	S	43	NE	26	23	5	2	2.1	86
Austin	615	997.6	1019.7	72	48	59.9	.7	84	17	36	23	0	0	42	57	.35	-2.00	.15	4	2	.0	0	9.9	NNE	34	NW	28	20	4	6	3.2	78
Brownsville	16	1015.6	1017.8	78	60	69.0	1.2	85	24	46	23	0	0	59	76	.89	-.66	.49	6	1	.0	0	10.8	NW	29	N	2+	13	8	9	4.9	67
Corpus Christi	40	1018.0	1018.9	77	55	65.7	1.4	84	17	41	6	0	0	54	71	.10	-1.64	.07	3	0	.0	0	11.6	N	29	S	26	17	5	8	4.2	77
Dallas	487	1001.4	1019.7	68	44	56.0	.2	77	7+	31	29	0	1	40	59	1.56	-.87	1.16	3	0	.0	0	6.0	NW	28	NW	28	19	5	6	3.0	77
Del Rio	1091	984.4	1019.2	74	45	59.4	-.8	85	17	34	5	0	0	37	48	.16	-.64	.16	1	0	.0	0	7.8	---	29	NW	4	20	6	4	2.5	82
El Paso	3920	889.3	1018.1	70	39	54.5	2.5	80	1	31	19+	0	2	27	35	.00	-.38	.00	0	0	.0	0	9.9	N	38	W	27	26	1	3	1.4	96
Fort Worth	544	999.0	1020.1	68	44	55.6	-.2	77	17+	30	29	0	1	39	60	1.24	-1.00	.84	5	0	.0	0	11.9	NNW	*29	NNW	18	19	6	5	3.0	--
Galveston CO	7	------	------	69	57	63.0	-.6	75	12+	45	5	0	0	--	--	3.60	-.24	3.13	4	--	.0	0	12.3	---	43	NW	22	--	--	--	---	75
Galveston	5	1016.9	1019.1	69	56	62.3	-1.1	76	28	45	5	0	0	53	74	2.81	-1.38	2.76	3	2	.0	0	13.0	ESE	---	---	--	16	6	8	4.0	--
Houston CO	41	1013.9	------	70	52	61.1	-.8	81	17	40	5	0	0	--	--	1.76	-2.19	.81	6	2	.0	0	9.7	---	27	NW	22	16	8	6	3.9	79
Houston	50	1016.6	1019.2	71	49	60.0	-.9	80	17	38	6+	0	0	47	66	1.74	-2.44	.99	5	2	.0	0	12.9	WNW	---	---	--	15	6	9	4.3	--
Laredo	500	1003.1	1018.4	78	53	65.3	-.7	88	17	43	5+	0	0	48	58	.18	-.79	.17	3	2	.0	0	10.4	NE	*28	NE	2	19	7	4	3.4	--
Lubbock	3243	905.9	1018.5	67	34	50.6	2.0	81	16	28	5	0	10	31	51	T	-.63	T	0	0	.0	0	13.1	WSW	*45	SW	27	23	4	3	2.3	--
Midland	2854	919.1	1018.6	68	40	54.2	1.4	82	26	33	6	0	0	30	46	.01	-.66	.01	1	0	.0	0	8.0	S	*24	NNE	26	22	5	3	2.2	--
Port Arthur	16	1017.6	1019.2	71	48	59.1	-.2	78	12	37	5+	0	0	48	73	1.41	-2.15	.68	5	1	.0	0	11.6	WNW	36	NW	19	17	5	8	4.2	71
San Angelo	1903	951.6	1019.3	69	42	55.5	-.9	83	23+	28	5	0	2	34	49	.28	-.81	.11	3	1	.0	0	9.4	W	*39	E	9	20	5	5	3.0	--
San Antonio	792	993.9	1019.1	73	48	60.6	.8	83	17	34	6	0	0	41	55	2.02	.62	1.05	4	2	.0	0	7.7	NNW	33	NW	9	21	1	8	3.4	78
Victoria	110	1014.2	1018.8	74	52	62.7	-1.1	81	21	40	6	0	0	48	62	1.34	-.89	.86	4	3	T	0	7.8	---	%62	NW	14	17	5	8	3.8	--
Waco	500	1000.7	1019.4	70	45	57.3	-.5	82	17	33	5	0	0	42	60	2.02	-.23	1.56	4	2	.0	0	11.9	N	---	---	--	20	3	7	3.0	--
Wichita Falls	1027	981.7	1018.9	68	42	55.1	3.4	80	6+	30	29	0	2	34	49	.23	-1.16	.12	2	1	.0	0	10.5	NW	*24	NW	18	19	6	5	2.9	--
UTAH																																
Milford	5028	848.6	1023.7	57	22	39.2	1.8	69	9	4	30	0	27	--	--	.67	.13	.35	3	0	6.5	6	----	---	---	---	--	15	10	5	4.1	--
Salt Lake City	4220	871.7	1022.7	57	31	44.0	4.7	72	11	15	29	0	21	31	65	1.61	.19	1.13	3	0	1.6	2	6.9	SSE	46	S	15	15	10	5	3.7	83
VERMONT																																
Burlington	331	1001.4	1016.5	45	31	38.1	1.7	64	20	17	13	0	20	33	81	3.08	.23	.94	14	0	4.0	1	10.5	S	42	SE	14	2	5	23	8.6	30
VIRGINIA																																
Lynchburg	947	984.8	1019.0	53	35	43.8	-3.5	71	14	24	27	0	16	--	--	3.59	1.22	.94	12	2	2.5	2	8.5	---	29	SW	29	9	6	15	6.1	49
Norfolk	26	1018.0	1019.1	58	42	50.0	-1.4	72	12	32	27+	0	2	41	73	2.13	-.54	.58	10	0	.0	0	9.2	NE	41	W	29	13	4	13	5.4	57
Richmond	162	1013.2	1019.3	56	36	46.1	-2.3	72	12	25	27	0	12	37	76	1.86	-.63	.58	11	1	.0	0	7.6	N	28	SW	29	11	6	13	5.7	50
Roanoke	1174	976.3	1019.5	52	34	43.1	-3.8	71	14	22	27	0	17	34	73	2.91	.10	.92	13	1	1.4	T	6.9	NW	---	---	--	8	5	17	6.3	--
WASHINGTON																																
Olympia	190	1010.5	1018.1	55	40	47.5	4.0	71	1	27	30	0	4	44	87	7.87	1.10	1.40	20	0	.0	0	6.9	SSW	*32	S	15	1	8	21	8.7	--
Seattle CO	14	------	------	55	47	51.3	4.3	65	21	36	30	0	0	--	--	6.92	2.46	1.30	23	1	.0	0	9.7	---	50	SE	15	0	7	23	8.9	13
Seattle	14	1017.3	1018.3	--	--	----	---	--	--	--	--	--	--	46	85	----	----	----	--	--	---	--	6.7	SSE	---	---	--	--	--	--	---	--
Seattle-Tacoma	379	1004.1	1018.3	54	44	49.0	5.1	62	21	29	30	0	1	45	89	7.67	3.12	1.39	20	0	.0	0	9.5	SE	---	---	--	1	6	23	8.7	--
Spokane	2357	950.6	1020.7	48	35	41.5	5.8	59	5	22	29	0	9	37	82	1.42	-.46	.38	12	0	T	T	7.2	NE	30	SW	19	2	7	21	8.4	26
Stampede Pass	3958	880.5	1020.7	40	33	36.4	4.8	52	21+	18	30	0	13	--	--	11.02	-2.24	2.95	18	0	15.1	12	----	---	---	---	--	3	2	25	8.5	--
Tatoosh	101	1012.5	1015.9	54	48	50.9	3.5	58	1+	38	29	0	0	47	87	22.17	12.65	3.79	23	1	T	T	16.7	E	59	S	19	1	5	24	8.9	19
Walla Walla CO	949	984.4	1021.0	56	43	49.3	6.8	69	22	27	30	0	2	--	--	1.38	-.48	.47	9	0	.0	0	5.3	---	29	W	19	4	7	19	7.5	27
Walla Walla	1200	------	------	--	--	----	---	--	--	--	--	--	--	40	--	-----	-----	----	--	--	----	--	----	---	---	---	--	--	--	--	---	--
Yakima	1061	980.7	1020.6	54	34	43.6	5.5	64	1	19	30	0	13	37	80	1.13	.15	.29	11	0	.0	0	5.1	W	---	---	--	10	2	18	6.8	--
WEST VIRGINIA																																
Charleston	950	982.4	1019.0	53	35	43.6	-2.2	73	18	24	3	0	14	35	76	1.43	-1.74	.43	11	0	.7	1	7.4	WSW	*40	WNW	24	6	3	21	7.4	--
Elkins	1970	------	------	49	29	38.8	-2.0	68	19+	18	27+	0	24	--	--	1.69	-1.18	.37	13	0	2.7	2	4.8	S	*32	WSW	29	6	4	20	7.2	--
Huntington	565	------	------	55	35	45.0	-1.7	78	17	25	3+	0	14	--	--	1.83	-.96	.86	11	0	1.0	1	----	---	---	---	--	--	--	--	---	--
Parkersburg CO	615	------	------	53	35	43.7	-1.3	73	17+	26	3	0	13	--	--	1.29	-1.38	.32	11	0	.6	T	5.3	---	66	NW	29	6	6	18	7.1	32
Parkersburg	837	------	1018.5	--	--	----	---	--	--	--	--	--	--	35	--	-----	-----	----	--	--	----	--	6.4	WSW	---	---	--	--	--	--	---	--
WISCONSIN																																
Green Bay	689	992.6	1016.1	45	29	36.6	3.1	64	11+	22	23+	0	24	30	77	.89	-1.05	.44	9	0	6.6	3	10.2	SW	38	SW	13	6	3	21	7.4	46
La Crosse	652	991.2	1016.6	46	30	37.9	3.6	68	17	19	30	0	22	30	73	.89	-.92	.37	8	0	6.7	4	11.3	S	*30	NW	24	5	7	18	7.3	--
Madison	857	980.7	1016.7	47	29	37.9	2.6	66	11+	19	30	0	23	30	76	.81	-1.48	.34	9	0	8.9	6	9.5	NW	28	SW	3+	7	3	20	7.0	45
Milwaukee	675	991.2	1016.7	47	33	40.2	2.9	68	16	22	30	0	14	33	76	1.06	-1.05	.49	9	0	7.6	4	11.5	SW	27	SW	3+	7	4	19	6.8	51
WYOMING																																
Casper	5322	838.8	1018.9	52	29	40.2	6.9	67	10	6	30	0	20	23	54	.25	-.57	.14	5	0	3.8	3	15.2	SW	---	---	--	8	14	8	5.5	--
Cheyenne	6131	812.7	1019.2	53	27	40.2	5.1	73	10	6	29	0	23	20	49	.28	-.42	.24	4	0	2.9	3	14.2	WNW	61	NW	27	17	6	7	4.0	70
Lander	5563	837.8	1021.1	52	26	39.0	9.0	64	10+	5	30	0	27	23	55	.15	-.72	.11	3	0	4.2	4	5.8	---	42	NW	27	12	13	5	4.4	77
Sheridan	3942	885.9	1019.8	56	28	41.7	8.6	74	22	4	30	0	24	--	--	.28	-.65	.14	4	0	1.1	1	8.0	WNW	65	NW	26	7	12	11	5.9	61
PACIFIC AREA																																
Canton Island	9	1009.8	1010.2	88	78	83.1	-.6	94	21	77	6+	9	0	71	72	.03	-.24	.03	1	0	.0	0	----	---	---	---	--	8	15	7	5.1	--
Hilo	31	1014.6	1015.9	82	65	73.9	.9	85	1+	61	21	0	0	64	76	16.04	3.65	6.74	13	1	.0	0	5.9	SW	*21	S	28	13	10	7	4.5	63
Honolulu	7	1016.3	1016.9	84	70	76.9	1.2	86	9	66	5+	0	0	67	74	9.36	7.60	9.15	5	3	.0	0	9.2	NE	45	SW	28	12	13	5	4.9	71
Koror CO	94	1005.8	1009.5	88	75	81.4	.0	91	27	72	7+	11	0	76	85	11.25	-.59	2.62	17	5	.0	0	----	---	---	---	--	0	9	21	8.5	--
Lihue	115	1010.8	1015.9	82	69	75.5	1.9	85	19+	64	4	0	0	69	82	9.76	5.52	8.36	11	2	.0	0	9.8	ENE	43	S	28	8	13	9	5.6	51
Ponape CO	112	1004.7	1009.9	87	73	80.0	-1.3	90	1+	70	30	2	0	75	88	22.52	8.05	5.31	28	5	.0	0	----	---	---	---	--	0	3	27	9.1	--
Truk (Moen Island)	8	1009.5	1009.8	85	76	80.4	-.4	88	7+	71	1	0	0	76	86	13.60	2.50	2.52	27	5	.0	0	----	---	---	---	--	0	2	28	9.4	--
Wake Island	11	1014.6	1014.9	85	77	80.7	.8	86	5+	71	23+	0	0	73	78	7.25	4.08	6.24	14	0	.0	0	13.0	E	---	---	--	22	7	1	3.0	--
Yap CO	53	1007.1	1009.2	87	75	81.3	-.5	90	15+	73	6	3	0	77	88	13.09	2.37	7.09	25	1	.0	0	----	---	---	---	--	0	4	26	9.0	--
WEST INDIES																																
San Juan, P.R. CO	47	------	------	83	73	77.8	-.6	85	24+	70	20	0	0	--	--	1.85	-4.52	.46	15	0	.0	0	----	---	---	---	--	--	--	--	---	--
San Juan, P.R.	9	1011.9	1014.0	84	72	78.3	.1	87	18	70	22+	0	0	70	80	1.48	-5.14	.26	14	0	.0	0	8.2	SSE	23	E	17	7	21	2	4.6	81

Data from airport unless otherwise specified. CO Indicates data from city office.

* Data entered in column "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.

+ And also on a later date or dates.

% Peak gust.

a Maximum hourly average.

HEATING DEGREE DAYS

(Base 65°F.)

Table 3

NOVEMBER 1954

State and station	Current season		Normals
	This month	Period July through this month	July through this month
ALABAMA			
Birmingham	418	576	532
Mobile	258	334	247
Montgomery	360	467	373
ARIZONA			
Flagstaff	756	1592	1832
Phoenix (CO)	29	41	195
Phoenix	39	53	245
Prescott	461	644	877
Tucson	91	104	246
Winslow	542	737	957
Yuma	13	15	105
ARKANSAS			
Ft. Smith	394	543	575
Little Rock	362	504	525
Texarkana	321	432	386
CALIFORNIA			
Bakersfield	311	351	314
Bishop	490	782	872
Blue Canyon	514	1162	1184
Burbank	102	166	256
Eureka (CO)	340	1422	1525
Fresno	372	454	431
Los Angeles (CO)	81	111	198
Los Angeles	106	188	396
Mt. Sbasta (CO)	629	1483	1387
Oakland	282	642	730
Red Bluff	364	443	378
Sacramento (CO)	378	459	413
Sacramento	409	523	477
Sandberg (CO)	386	656	702
San Diego	64	99	241
San Francisco (CO)	245	884	841
San Francisco	339	879	873
San Jose	276	440	411
Santa Maria	208	688	722
COLORADO			
Alamosa	927	1843	2207
Colorado Springs	676	1193	1352
Denver	616	1486	1332
Grand Junction	669	1018	1161
Pueblo	609	978	1228
CONNECTICUT			
Bridgeport	608	924	1045
Hartford	694	1151	1198
New Haven	651	1052	1137
DELAWARE			
Wilmington	630	915	914
DIST. OF COLUMBIA			
Washington (CO)	567	793	773
Washington	587	804	793
FLORIDA			
Apalachicola (CO)	187	227	171
Daytona Beach	146	178	83
Fort Myers	32	33	25
Jacksonville (CO)	186	236	140
Jacksonville	205	260	164
Key West (CO)	0	0	0
Miami (CO)	4	4	5
Int. Airport, Hialeah	0	0	8
Miami Beach	0	0	0
Orlando	104	119	61
Pensacola (CO)	214	274	195
Tallahassee	261	337	240
Tampa	93	109	60
West Palm Beach	8	8	7
GEORGIA			
Athens	478	629	495
Atlanta	460	605	511
Augusta	419	562	341
Columbus	393	523	404
Macon	360	474	343
Rome	525	734	583
Savannah	328	435	263
IDAHO			
Boise	636	1264	1286
Lewiston	630	1298	1286
Pocatello	739	1541	1543
ILLINOIS			
Cairo (CO)	466	679	681
Chicago (CO)	629	960	
Chicago	666	1026	1205
Chicago University	665	1036	
Moline	722	1177	1253
Peoria	689	1069	1195
Springfield	658	1026	1127
INDIANA			
Evansville	567	874	844
Ft. Wayne	720	1152	1260
Indianapolis	682	1055	1090
South Bend	725	1198	1289
IOWA			
Burlington	682	1105	1184
Des Moines	669	1121	1269
Dubuque	795	1373	1511
Sioux City	661	1171	1443
KANSAS			
Concordia (CO)	523	832	1019
Dodge City	498	812	971
Goodland	670	1173	1333
Topeka (CO)	487	755	914
Topeka	525	796	1010
Wichita	467	693	848
KENTUCKY			
Lexington	606	926	951
Louisville (CO)	511	749	796
Louisville	559	852	862
Pikeville (CO)	557	788	
LOUISIANA			
Baton Rouge	226	295	242
Lake Charles	186	231	240
New Orleans (CO)	150	192	146
Int. Airport, Moisant	193	249	176
Shreveport	285	366	358
MAINE			
Caribou	963	2275	2356
Greenville (CO)	919	2031	
Portland	785	1570	1610
MARYLAND			
Baltimore (CO)	529	708	725
Baltimore	641	923	910
Frederick	696	1031	911
MASSACHUSETTS			
Blue Hill Obs.	710	1265	
Boston	612	978	1017
Nantucket	568	978	1154
Pittsfield	826	1626	1687
MICRIGAN			
Alpena (CO)	770	1582	1744
Detroit	705	1141	1232
Detroit (Willow Run)	722	1166	1258
East Lansing (CO)	735	1227	
Escanaba (CO)	793	1712	1892
Grand Rapids (CO)	681	1160	1275
Grand Rapids	746	1310	1471
Marquette (CO)	808	1837	1868
Muskegon	729	1308	1483
Sault Ste. Marie	858	2032	2177
MINNESOTA			
Duluth (CO)	962	2160	2140
Duluth	984	2190	2236
International Falls	1053	2384	2490
Minneapolis	795	1484	1601
Rochester	839	1600	1718
St. Cloud	891	1846	1948
MISSISSIPPI			
Jackson	321	437	379
Meridian	350	485	428
Vicksburg (CO)	263	359	319
MISSOURI			
Columbia	561	863	984
Kansas City	478	732	905
St. Joseph	566	878	1000
St. Louis (CO)	521	792	810
St. Louis	568	865	878
Springfield	538	817	933
MONTANA			
Billings	626	1332	1595
Glasgow (CO)	708	1586	1948
Great Falls	604	1549	1765
Havre (CO)	676	1529	1915
Helena	772	1840	2038
Kalispell	805	2138	2085
Miles City	699	1430	1695
Missoula	790	1926	1987
NEBRASKA			
Grand Island	638	1114	1281
Lincoln (CO)	589	973	1137
Norfolk	668	1190	1464
North Platte	737	1314	1409
Omaha	575	970	1207
Scottsbluff	737	1317	1460
Valentine (CO)	691	1341	1518
NEVADA			
Elko	786	1750	1724
Ely	781	1704	1749
Las Vegas	229	292	405
Reno	700	1479	1440
Tonopah	607	1058	1246
Winnemucca	766	1650	1527
NEW HAMPSHIRE			
Concord	802	1533	1636
Mt. Washington	1343	4404	
NEW JERSEY			
Atlantic City (CO)	539	732	766
Newark	601	888	951
Trenton (CO)	611	900	922
NEW MEXICO			
Albuquerque	483	637	858
Clayton	553	898	1064
NEW MEXICO (Cont'd.)			
Roswell	437	607	665
NEW YORK			
Albany	752	1304	1386
Binghamton	833	1516	1623
Buffalo	693	1219	1354
New York (CO)	569	826	863
La Guardia Field	537	753	824
Rochester	701	1263	1375
Schenectady	716	1219	
Syracuse	717	1224	1256
NORTH CAROLINA			
Asheville (CO)	650	961	864
Asheville	708	1070	
Charlotte	492	665	592
Greensboro	607	841	741
Ratteras (CO)	269	327	307
Raleigh	530	732	603
Wilmington	348	486	361
Winston-Salem	588	804	702
NORTR DAKOTA			
Bismarck	850	1767	1989
Devils Lake (CO)	944	2109	2235
Fargo	906	1808	1989
Grand Forks	973	1985	
Pembina	891	1743	
Williston (CO)	776	1739	2038
OHIO			
Akron	736	1230	1216
Cincinnati (CO)	540	801	831
Cincinnati	634	991	1026
Cleveland (CO)	619	954	1016
Cleveland	663	1041	1124
Columbus	668	1051	1107
Dayton	680	1058	1096
Sandusky (CO)	670	1004	1077
Toledo	717	1162	1257
Youngstown	743	1244	1189
OKLAROMA			
Oklahoma City	392	545	648
Tulsa	367	502	632
OREGON			
Astoria	426	1361	1270
Burns (CO)	707	1670	1673
Eugene	457	1227	1183
Meacham	721	2082	1992
Medford	564	1064	1027
Pendleton	550	1147	1174
Portland (CO)	397	864	926
Portland	452	1079	1067
Roseburg	484	1150	
Salem	472	1200	1071
Sexton Summit (CO)	597	1700	1496
PENNSYLVANIA			
Allentown	723	1131	1154
Harrisburg	670	991	1007
Philadelphia (CO)	554	770	768
Philadelphia	583	826	889
Pittsburgh (CO)	615	939	966
Pittsburgh	697	1126	1211
Reading (CO)	630	918	935
Scranton (CO)	702	1155	1215
Williamsport	724	1142	1193
RHODE ISLAND			
Block Island	572	904	1036
Providence	658	1079	1186
SOUTB CAROLINA			
Charleston (CO)	254	322	248
Charleston	319	425	322
Columbia	438	575	420
Florence	380	507	441
Greenville	510	676	552
Spartanburg	510	675	557
SOUTH DAKOTA			
Buron	761	1432	1622
Pierre	707	1353	
Rapid City	665	1338	1640
Sioux Falls	745	1411	1648
TENNESSEE			
Bristol	622	918	873
Chattanooga	527	734	670
Knoxville	563	779	710
Memphis	431	595	575
Nashville	498	728	647
TEXAS			
Abilene	275	374	453
Amarillo	428	630	871
Austin	152	192	244
Brownsville	17	17	59
Corpus Christi	55	65	113
Dallas	263	341	352
Del Rio	169	203	214
El Paso	308	354	460
Ft. Worth	276	353	357
Galveston (CO)	80	99	131
Galveston	95	118	132
Houston (CO)	119	149	162
TEXAS (Cont'd.)			
Houston	151	187	188
Laredo	48	54	91
Lubbock	424	612	688
Midland	319	424	
Port Arthur	178	225	238
San Angelo	279	361	352
San Antonio	142	171	226
Victoria	87	106	131
Waco	228	289	295
Wichita Falls	290	382	524
UTAH			
Milford	766	1282	1404
Salt Lake City	622	1121	1240
VERMONT			
Burlington	799	1634	1617
VIRGINIA			
Lynchburg	630	895	816
Norfolk	442	591	569
Richmond	561	786	741
Roanoke	651	933	826
WASHINGTON			
Olympia	520	1444	1460
Seattle (CO)	404	1061	1097
Seattle	474	1383	1382
Spokane	696	1614	1637
Stampede Pass (CO)	855	2898	2628
Tatoosh Island (CO)	415	1664	1832
Walla Walla (CO)	464	942	1076
Yakima	635	1430	1410
WEST VIRGINIA			
Charleston	636	970	886
Elkins	774	1322	1300
Runtington (CO)	593	878	794
Parkersburg (CO)	630	961	928
WISCONSIN			
Green Bay	847	1663	1733
La Crosse	803	1432	1551
Madison (CO)	782	1332	1460
Madison	806	1394	1544
Milwaukee	736	1244	1445
WYOMING			
Casper	738	1435	1796
Cheyenne	736	1428	1787
Lander	772	1542	1956
Sheridan	693	1452	1842
ALASKA			
Anchorage	1112	2861	3220
Annette	568	1959	2126
Barrow	1939	5527	6055
Bethel	1266	3508	3767
Cordova	874	2779	3000
Fairbanks	1567	3741	4077
Juneau	791	2538	2807
Kotzebue	1621	4413	4500
McGrath	1582	3867	4137
Nome	1342	4052	4191
Northway	1623	4306	4489
St. Paul	925	3600	3449
Yakutat	814	2761	2918

Data from airport unless otherwise specified.
CO indicates data from city office.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4

NOVEMBER 1954

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Centre, County, Pa.	2	1:20 a.m.			1		$8,300		Snow	Trucker killed when his vehicle skidded off snow-covered highway at curve.
Off Cape Elizabeth, Maine	2	1:15-1:50 p.m.			0	0	0	$0	Waterspout	Waterspout made contact with water for about 5 minutes then receded into parent cloud. Thereafter, it could be seen for another half-hour, alternately sticking down about halfway to water and then almost disappearing into cloud. Movement of waterspout (and parent cloud) with respect to Control Tower at WBAS Portland was from south-southeast to south-southwest. Incomplete funnel finally swung inland near Biddeford Pool, Maine, and disappeared into cloud. At time of occurrence, sky overcast with 10/10 stratocumulus at altitude of 2,000 feet. Phenomenon observed by many.
Topsail Island, N. C.	2	2:30 p.m.	**100	25	0	0	20,000		Tornado	Store building and 2 homes demolished, in area already badly damaged by hurricane Hazel. Moved northeastward.
	2									Minor storm also reported at Lewes, Del.
San Antonio, Bexar County, Tex.	9				1	3			Electrical	Man killed by lightning during football practice; 3 others stunned.
Puget Sound area, extending from south of Tacoma to north of Everett, Wash.	15-16	11 p.m., 15th-3 a.m., 16th.	75	*50			25,000		Wind	Rapidly developing ridge of high pressure in area created funneling effect betwin Olympic and Cascade Mountains. Southwest winds, ranging from 50 to 64 m.p.h., damaged power and telephone lines in Seattle and vicinity. 1 house boat, several pleasure boats, and 4 small planes damaged in Seattle. Coast Guard called to assist several fishing boats on Puget Sound.
	17									Minor storm also reported at Annette, Alaska.
Lake Placid (5 miles southwest of), Fla.	18	4:45-5 p.m.			0	0	0	0	Tornado	Extended halfway from cloud base to ground; moved east-southeastward.
Herndon, Northumberland County, Pa.	19	Afternoon			1				Rain	Auto driver killed when car skidded on wet highway and went down 30-foot embankment.
Panama City, Fla.	22	Midafternoon							Thunderstorm	Wind damaged several new buildings under construction and ripped several power lines from their poles. Flying debris damaged several cars in vicinity of buildings. Some roadside signs also blown over.
Wadena and vicinity, Minn.	23	A.m.-p.m.					10,000		Winds	Considerable minor damage to property and unpicked corn over entire State. At Wadena, where gusts of wind up to 62 m.p.h. recorded, 9 store fronts blown in, signs and antennas torn down, and barn in vicinity of Wadena moved from its foundation.
Burley (25 miles southeast of), Idaho	25	Evening			6	5			Blowing dust	Deaths occurred in traffic accident attributable to blowing dust; truck had stopped beside highway because of poor visibility and car had pulled up behind it; third car rammed middle vehicle, causing gasoline tank to explode as spark ignited fuel. All six passengers of middle vehicle trapped and burned to death. 5 passengers in third vehicle injured.
	27-30									Minor storms also occurred in Colorado.
Island of Oahu, Hawaii	28-29				2		750,000	70,000	Rain and wind	Storm Island-wide. Probably 90 percent of damage due to flooding. Drainage inadequate for excessively heavy rainfall which broke former 24-hour records over much of Island. Heavy losses to military installations. Small business houses along raging stream at Waipahu moved from foundations or demolished. Landslide at Lenikai damaged homes. Wind damaged a few buildings; falling trees disrupted wire services. 2 persons swept off their feet and drowned by rushing waters.
Cabarrus County, N. C.	28	9:30 p.m.	2	500	0	0	20,000		Tornado	Probable tornado demolished farm home and outbuildings and blew down snd twisted off trees.
	28-29									Minor storms also reported on Island of Kauai and in Hilo-Volcano area, Hawaii.

* Miles instead of yards.
** Yards instead of miles.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

NOVEMBER 1954

Very little damage, if any, was reported from minor flooding during November.

Several record-low stages were established at scattered points throughout the eastern half of the Country.

ATLANTIC SLOPE DRAINAGE

The minor flooding on the Roanoke River at Randolph, Va., on the 21st and 22d was due to precipitation (2 inches) between the 16th and the 21st. No damage was reported.

A new record-low stage of -3.6 feet was established on the Altamaha River at Doctortown, Ga., on the first of the month.

EAST GULF OF MEXICO DRAINAGE

A new record-low November stage of 0.97 foot was established on the Cahaba River at Marion Junction, Ala., on the 3d and 4th. The previous November low record was 1.40 feet on November 1, 1952.

Record-low November stages of -2.1 and -1.8 feet were reached on the Apalachicola River at Chattahoochee and Blountstown, Fla., respectively.

The drought during 1954 was the worst of record in Alabama. In 71 years of record, 1884-1954, there were only two occasions when the precipitation was deficient for a period of 10 or more consecutive months. The first period was 13 consecutive months from July 1903 to July 1904, but the deficiency was only 19.09 inches for the period, or 68 percent of normal. The second period was 10 consecutive months from October 1913 to July 1914, but the deficiency was only 16.02 inches for the period, or only 64 percent of normal. During 1954 the average deficiency was 19.35 inches, or 58 percent of normal.

MISSISSIPPI SYSTEM

Missouri Basin.--Record-breaking droughty conditions prevailed in the Kansas River Basin in the State of Kansas, with the driest November reported in 68 years of record. Most of the basin received no measurable moisture and amounts elsewhere were limited to a few hundredths of an inch. River stages remained low throughout the month.

Arkansas Basin.--A new record-low mean monthly stage of 2.4 feet was established on the Arkansas River at Tulsa, Okla., during November. This stage was 2.3 feet below the normal stage. The previous low mean monthly stage was 2.9 feet for November 1939. The lowest daily stage was 2.3 feet. This is lower by one-half foot than the previous lowest November stage of 1939. A new record-low mean monthly stage of 2.3 feet was recorded 171 miles downstream from Tulsa at Van Buren, Ark. This was 4.7 feet below normal. The previous low was 2.5 feet for November 1939. At Perkins, Okla., on the Cimarron River, the mean monthly stage was 2.4 feet or 2.1 feet below normal. This was the lowest mean November stage of record. The previous low was 2.7 feet in November 1952. The November 1954 stage also equalled the previous low mean monthly stage for all months. August 1954 also showed 2.4 feet.

Red River Basin.--The minor flooding on the Sulphur River at Naples, Tex., during the first 3 days of November was a continuation of the flood that began on October 29. This overflow was due to heavy showers and thundershowers on October 21-22. Little or no damage resulted from the flooding.

WEST GULF OF MEXICO DRAINAGE

The Sabine River, which was above bankfull stage at Mineola, Tex., on October 31, receded to within its banks on November 2. Another rise to above bankfull stage occurred at Mineola between the 9th and 11th. No damage was reported. The total rainfall for the month was slightly below normal and was reported almost entirely on the 4th and 15th.

PACIFIC SLOPE DRAINAGE

Heavy rains between the 8th and 16th caused light overflow on the Sacramento River at the Tisdale Weir, Calif., between the 16th and 18th. Most stations at middle and high elevations recorded 5 to 8 inches of precipitation, with some stations reporting a total for the period of as much as 11 inches.

Heavy rains caused minor flooding along the Snoqualmie and Snohomish Rivers on the 18th and 19th. The Snoqualmie barely exceeded flood stage, but the Snohomish exceeded bankfull stage by about 2 feet. Substantial rise approaching flood stage occurred in all other streams in western Washington on the 18th, 19th, 20th, and 27th.

FLOOD STAGE DATA

Table 5

(All dates in November unless otherwise specified)

NOVEMBER 1954

River and station	Flood stage	Above flood stages -dates		Crest *	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE	*Ft*			*Ft*	
Roanoke: Randolph, Va.	21	21	22	**21.3	22
MISSISSIPPI SYSTEM Red River Basin					
Sulphur: Naples, Tex.	22	Oct. 29	3	24.76	Oct. 31
WEST GULF OF MEXICO DRAINAGE	*Ft*			*Ft*	
Sabine: Mineola, Tex.	14	Oct. 26 9	2 11	16.74 14.98	Oct. 30 10
PACIFIC SLOPE DRAINAGE					
Sacramento: Tisdale Weir, Calif.	45.5	16	18	46.9	17
Snohomish: Snohomish, Wash.	23	18	19	25.7	18
Snoqualmie: Carnation, Wash.	51	18	19	51.8	18

* Provisional

** Highest stage reported but not necessarily the crest.

RADIOSONDE DATA

Average monthly values

Table 20

NOVEMBER 1954

Standard pressure surface (mb.)	ALBUQUERQUE, N. MEX. (841 MB.)				ATLANTA, GA. (984 MB.)				BISMARCK, N. DAK. (956 MB.)				BOISE, IDAHO (920 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	1,619	10.4	35	30	309	8.5	71	30	505	2.1	70	30	868	6.0	66
1,000	30	140			30	172			30	135			30	179		
950	30	586			30	602	9.5	61	30	559	3.3	63	30	608		
900	30	1,045			30	1,047	7.3	59	30	994	4.5	54	30	1,053	9.8	53
850	30	1,525			30	1,515	5.4	53	30	1,458	2.5	50	30	1,526	8.5	42
800	30	2,032	10.3	28	30	2,009	3.5	46	30	1,946	.2	50	30	2,024	5.4	43
750	30	2,574	6.6	29	30	2,539	1.3	46	30	2,469	-2.3	51	30	2,553	2.1	42
700	30	3,128	2.9	31	30	3,084	-1.1	40	30	3,006	-5.1	49	30	3,102	-1.2	42
650	30	3,727	-.7	30	30	3,678	-4.0	34	30	3,592	-8.6	48	30	3,696	-4.7	44
600	30	4,358	-4.6		30	4,299	-7.2	38	30	4,201	-11.8	45	30	4,316	-8.2	45
550	30	5,035	-8.7		30	4,974	-11.7	35	30	4,867	-15.3	45	30	4,990	-12.0	43
500	29	5,774	-13.7		30	5,695	-16.2		30	5,576	-20.0	43	30	5,710	-16.4	42
450	29	6,574	-19.3		30	6,492	-21.7		30	6,361	-25.7	42	30	6,503	-21.9	42
400	29	7,431	-26.0		30	7,336	-28.0		30	7,192	-31.8		29	7,353	-27.8	41
350	29	8,383	-33.1		30	8,280	-35.2		30	8,122	-38.5		29	8,298	-35.3	
300	29	9,446	-41.3		30	9,337	-42.8		30	9,164	-45.6		29	9,352	-43.4	
250	29	10,660	-49.4		28	10,538	-49.4		30	10,361	-51.8		29	10,557	-51.2	
200	29	12,096	-56.3		28	11,981	-54.8		30	11,789	-56.0		29	11,986	-57.2	
175	28	12,936	-59.3		28	12,830	-57.2		30	12,637	-56.2		29	12,826	-58.7	
150	28	13,894	-61.7		25	13,802	-59.8		30	13,615	-56.7		28	13,798	-59.5	
125	28	15,014	-64.7		25	14,933	-62.2		30	14,767	-57.9		25	14,926	-60.8	
100	25	16,365	-67.3		20	16,307	-64.4		28	16,168	-58.8		25	16,309	-61.9	
80	17	17,706	-65.4		17	17,667	-64.4		26	17,576	-58.9		23	17,692	-61.4	
60	10	19,463	-62.9		12	19,443	-62.1		21	19,368	-58.4		18	19,475	-60.0	
50	8	20,588	-61.0		12	20,574	-60.7		16	20,497	-50.2		13	20,611	-59.2	
40					8	21,960	-59.6		12	21,890	-58.8		11	22,009	-57.3	
30									9	23,705	-59.0					

Standard pressure surface (mb.)	BROWNSVILLE, TEX. (1017 MB.)				BUFFALO, N. Y. (994 MB.)				BURRWOOD, LA. (1018 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	7	18.9	80	29	221	3.9	86	30	3	16.7	76
1,000	30	156	20.7	68	29	128	3.5		30	155	16.5	68
950	30	603	18.1	66	29	547	3.5	72	30	591	13.8	62
900	30	1,060	15.7	55	29	984	.5	74	30	1,044	11.6	53
850	30	1,544	13.3	51	29	1,441	-1.5	70	30	1,521	9.9	43
800	30	2,052	11.3	40	29	1,923	-3.6	65	30	2,022	7.7	43
750	30	2,596	8.9	34	29	2,433	-5.7	60	30	2,558	5.2	42
700	30	3,157	5.9	32	29	2,969	-8.4	55	30	3,113	2.6	35
650	30	3,760	2.3	31	29	3,547	-11.4	52	30	3,711	-.3	37
600	29	4,403	-1.8		29	4,150	-15.2	49	30	4,345	-4.0	36
550	29	5,090	-6.2		29	4,808	-19.1	44	30	5,024	-8.1	31
500	29	5,829	-11.1		29	5,505	-23.6	39	30	5,760	-12.9	27
450	29	6,639	-17.0		29	6,272	-29.0		30	6,564	-18.7	
400	29	7,502	-23.6		29	7,100	-34.6		30	7,422	-25.4	
350	28	8,465	-30.5		28	8,014	-41.5		30	8,376	-32.7	
300	28	9,542	-38.5		28	9,045	-47.0		28	9,445	-40.5	
250	28	10,770	-46.8		28	10,239	-51.4		26	10,664	-48.6	
200	28	12,220	-55.6		27	11,675	-53.7		26	12,108	-55.3	
175	28	13,060	-60.1		23	12,523	-54.4		26	12,952	-58.6	
150	28	14,011	-64.3		22	13,509	-55.8		25	13,917	-62.5	
125	27	15,116	-68.7		18	14,656	-57.7		24	15,028	-66.6	
100	24	16,440	-71.1		11	16,079	-59.0		24	16,368	-68.4	
80	21	17,760	-69.9		7	17,440	-57.7		20	17,700	-67.5	
60	15	19,481	-64.5						16	19,449	-64.2	
50	14	20,607	-60.9						13	20,556	-62.9	
40	11	21,989	-58.5						9	21,921	-61.0	
30	7	23,823	-56.4						5	23,746	-58.2	

Standard pressure surface (mb.)	CARIBOU, ME. (992 MB.)				CHARLESTON, S. C. (1017 MB.)				COLUMBIA, MO. (990 MB.)				DODGE CITY, KANS. (927 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	191	0.4	79	30	13	10.3	79	30	238	7.2	64	30	792	7.9	48
1,000	30	127	-2.5		30	157	13.4	65	30	150			30	157		
950	30	542	-.6	74	30	597	11.4	59	30	577	8.4	53	30	588		
900	30	970	-2.5	73	30	1,038	8.9	57	30	1,020	5.6	57	30	1,039	10.7	37
850	30	1,422	-4.2	70	30	1,509	6.7	54	30	1,485	3.2	55	30	1,514	8.3	38
800	30	1,898	-5.9	65	30	2,005	4.9	46	30	1,975	1.0	53	30	2,012	5.4	38
750	30	2,407	-8.0	60	30	2,542	2.8	38	30	2,495	-1.6	51	30	2,542	2.7	32
700	30	2,935	-10.7	56	30	3,085	.1	38	30	3,038	-4.2	49	30	3,092	-.1	34
650	30	3,506	-12.9	45	30	3,685	-2.7	38	30	3,623	-7.2	46	30	3,688	-3.2	34
600	30	4,109	-15.9	42	30	4,307	-5.9	35	30	4,239	-10.5	44	30	4,311	-7.3	36
550	29	4,764	-19.7	41	30	4,993	-10.2	34	30	4,907	-14.3	42	30	4,989	-11.5	37
500	29	5,460	-24.1	41	30	5,710	-14.8		30	5,620	-19.4	40	30	5,709	-16.1	
450	29	6,230	-29.1	43	30	6,513	-20.2		30	6,399	-24.8		30	6,498	-21.6	
400	29	7,053	-34.7	45	30	7,361	-26.6		30	7,242	-30.8		30	7,351	-28.3	
350	28	7,976	-41.0		30	8,311	-33.9		30	8,175	-37.6		30	8,295	-35.2	
300	28	9,007	-47.2		30	9,372	-41.7		30	9,222	-44.3		29	9,362	-42.8	
250	28	10,201	-50.8		30	10,586	-48.9		30	10,426	-50.2		28	10,573	-50.8	
200	28	11,644	-53.1		30	12,030	-54.9		29	11,867	-55.0		28	12,005	-56.7	
175	28	12,503	-53.8		30	12,876	-57.9		28	12,724	-56.8		28	12,847	-58.1	
150	27	13,480	-54.7		30	13,841	-60.9		27	13,705	-58.2		28	13,811	-60.3	
125	25	14,637	-56.0		29	14,970	-63.8		26	14,846	-60.5		27	14,943	-62.3	
100	24	16,038	-57.5		29	16,327	-66.1		25	16,233	-62.4		24	16,309	-63.7	
80	23	17,440	-57.6		27	17,683	-65.1		25	17,610	-61.9		22	17,678	-63.6	
60	22	19,253	-58.8		24	19,446	-62.2		23	19,390	-60.7		18	19,452	-61.8	
50	20	20,394	-59.1		22	20,576	-60.9		22	20,524	-60.0		12	20,582	-60.6	
40	15	21,790	-59.5		20	21,970	-59.5		21	21,917	-59.0		9	21,986	-59.7	
30	6	23,609	-60.0		14	23,784	-57.5		20	23,729	-57.9		5	23,798	-57.5	
20					5	26,359	-56.5		12	26,326	-55.3					
15									5	28,183	-53.9					

Standard pressure surface (mb.)	EL PASO, TEX. (884 MB.)				ELY, NEV. (813 MB.)				GLASGOW, MONT. (940 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	1,195	13.1	34	30	1,908	2.1	64	30	648	4.7	62
1,000	30	141			30	183			30	132		
950	30	588			30	622			30	558		
900	30	1,050			30	1,070			30	1,001	6.9	48
850	30	1,531	14.6	25	30	1,537			30	1,468	4.5	49
800	30	2,039	11.7	25	30	2,035	7.3	49	30	1,960	2.0	50
750	30	2,583	8.0	26	30	2,567	4.3	43	30	2,482	-1.1	51
700	30	3,140	4.4	24	30	3,121	.3	42	30	3,025	-4.3	49
650	30	3,744	.7		30	3,715	-2.9	42	30	3,611	-7.9	48
600	30	4,376	-3.1		30	4,342	-6.4	40	30	4,223	-11.7	48
550	30	5,061	-7.7		30	5,022	-10.2	40	30	4,890	-15.8	46
500	30	5,792	-13.0		30	5,746	-15.1	40	30	5,597	-20.2	45
450	29	6,594	-19.2		30	6,542	-20.4		30	6,377	-25.5	41
400	29	7,451	-25.9		30	7,396	-26.6		29	7,217	-31.2	39
350	29	8,402	-33.2		30	8,346	-33.9		29	8,149	-38.2	
300	29	9,467	-41.0		30	9,407	-42.1		29	9,194	-44.9	
250	28	10,686	-49.5		30	10,616	-50.6		29	10,393	-52.0	
200	28	12,122	-56.6		30	12,047	-57.1		29	11,817	-57.6	
175	28	12,962	-60.0		30	12,888	-58.9		28	12,672	-57.7	
150	27	13,915	-63.8		30	13,850	-61.2		28	13,646	-57.4	
125	27	15,022	-67.0		29	14,976	-63.8		28	14,796	-58.2	
100	27	16,360	-69.6		27	16,348	-65.5		27	16,192	-58.7	
80	25	17,693	-68.8		26	17,704	-65.2		24	17,583	-58.0	
60	22	19,429	-64.7		22	19,469	-63.0		22	19,390	-57.8	
50	21	20,547	-62.7		19	20,594	-62.0		18	20,552	-58.0	
40	19	21,926	-60.7		13	21,976	-60.5		13	21,953	-57.4	
30	10	23,747	-59.0		8	23,801	-58.9		5	23,746	-56.5	
20												
15												

Standard pressure surface (mb.)	GRAND JUNCTION, COLO. (856 MB.)				GREAT FALLS, MONT. (888 MB.)				GREEN BAY, WIS. (990 MB.)				GREENSBORO, N. C. (987 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	1,474	5.6	61	30	1,128	6.9	54	30	210	2.3	80	30	273	5.2	87
1,000	30	177			30	131			30	123	4.1		30	163		
950	30	611			30	568			30	543	2.8	69	30	585	8.0	61
900	30	1,062			30	1,016			30	976	.5	68	30	1,031	6.0	63
850	30	1,534	8.0	51	30	1,486	7.6	44	30	1,433	-1.1	63	30	1,497	3.5	62
800	30	2,033	6.6	44	30	1,983	4.5	47	30	1,915	-2.4	56	30	1,987	1.2	58
750	30	2,565	3.7	42	30	2,510	.9	48	30	2,431	-5.0	54	30	2,510	-.4	51
700	30	3,117	.4	40	30	3,057	-2.8	48	30	2,965	-7.5	53	30	3,055	-2.8	46
650	30	3,715	-3.1	42	30	3,644	-6.5	51	30	3,545	-10.2	50	30	3,643	-5.9	45
600	30	4,337	-6.5	41	30	4,263	-9.9	53	30	4,152	-13.2	48	30	4,262	-9.4	42
550	30	5,014	-10.4	38	30	4,930	-14.1	53	30	4,812	-17.4	45	30	4,929	-13.5	38
500	30	5,739	-15.2	35	30	5,647	-18.7	53	30	5,516	-22.1	47	30	5,647	-17.9	33
450	30	6,537	-20.6		30	6,430	-24.2	49	30	6,286	-27.7	49	30	6,436	-23.5	
400	29	7,387	-27.0		30	7,273	-30.4	47	30	7,119	-33.6	41	30	7,277	-29.7	
350	29	8,334	-34.4		30	8,207	-37.7	49	30	8,042	-39.8		29	8,220	-36.2	
300	29	9,393	-42.6		30	9,253	-45.0		30	9,079	-46.1		28	9,272	-43.1	
250	29	10,600	-50.7		29	10,448	-52.4		30	10,277	-49.9		28	10,482	-49.1	
200	29	12,033	-56.4		29	11,869	-58.2		30	11,725	-52.4		26	11,932	-53.8	
175	28	12,874	-58.6		29	12,708	-58.7		30	12,586	-53.1		24	12,778	-55.5	
150	28	13,837	-60.5		29	13,675	-58.8		30	13,575	-54.2		24	13,754	-57.9	
125	27	14,960	-62.7		29	14,819	-59.0		30	14,737	-56.2		23	14,884	-60.6	
100	25	16,325	-65.2		27	16,224	-60.4		30	16,147	-58.2		22	16,267	-62.7	
80	24	17,686	-64.5		26	17,612	-59.5		26	17,541	-57.3		20	17,633	-61.6	
60	20	19,456	-62.9		18	19,408	-59.4		24	19,354	-57.7		19	19,424	-59.6	
50	15	20,577	-61.7		15	20,542	-58.7		21	20,496	-57.8		19	20,563	-59.6	
40	10	21,970	-59.9		13	21,963	-58.0		16	21,901	-58.3		16	21,959	-58.9	
30	7	23,780	-59.5						12	23,719	-57.7		7	23,744	-58.2	

Standard pressure surface (mb.)	HATTERAS, N. C. (1018 MB.)				HILO, T. H. (1014 MB.)				INTERNAT. FALLS, MINN. (970 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	3	13.1	79	30	9	25.6	70	30	360	-0.6	77
1,000	30	149	13.3	72	30	133	23.8	71	30	117		
950	30	584	10.8	68	30	583	20.4	76	30	532	-.7	72
900	30	1,028	7.9	66	30	1,045	17.0	81	30	960	-2.4	73
850	30	1,498	5.5	58	30	1,531	14.4	74	30	1,413	-3.3	74
800	30	1,992	3.4	50	30	2,043	13.7	41	30	1,892	-4.4	68
750	30	2,523	1.5	41	30	2,593	11.7	30	30	2,406	-6.4	60
700	30	3,066	-.7	38	30	3,159	9.1	31	30	2,935	-9.2	57
650	30	3,659	-3.8	35	30	3,774	5.7	31	29	3,515	-11.5	49
600	30	4,282	-7.6	35	30	4,420	2.2		29	4,116	-15.0	48
550	30	4,958	-11.8	35	30	5,117	-2.0		29	4,773	-19.0	44
500	30	5,677	-16.5		30	5,869	-6.9		29	5,471	-23.6	
450	30	6,471	-21.6		30	6,692	-13.0		29	6,240	-28.7	
400	30	7,318	-27.6		30	7,569	-19.6		29	7,068	-34.0	
350	30	8,266	-34.3		30	8,545	-27.1		27	7,991	-40.3	
300	30	9,326	-41.9		30	9,636	-35.6		27	9,025	-47.6	
250	29	10,538	-48.7		30	10,877	-45.2		27	10,214	-52.6	
200	29	11,985	-54.1		30	12,330	-55.8		26	11,649	-54.7	
175	28	12,842	-56.4		30	13,168	-61.6		24	12,492	-54.6	
150	28	13,814	-59.1		29	14,112	-67.5		24	13,478	-54.7	
125	28	14,948	-62.2		25	15,199	-72.9		24	14,642	-55.4	
100	25	16,321	-64.5		9	16,505	-76.8		24	16,060	-57.0	
80	23	17,691	-63.6						22	17,463	-57.2	
60	22	19,461	-61.6						15	19,298	-57.6	
50	22	20,592	-61.0						14	20,452	-58.5	
40	20	21,982	-59.6						11	21,852	-58.8	
30	13	23,803	-57.6						8	23,632	-60.2	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

NOVEMBER 1954

Standard pressure surface (mb.)	LAKE CHARLES, LA. (1019 MB.)				LANDER, WYO. (831 MB.)				LAS VEGAS, NEV. (941 MB.)				LITTLE ROCK, ARK. (1009 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	5	13.8	72	30	1,696	3.4	55	30	660	14.2	33	30	79	9.8	68
1,000--	30	160	15.7	61	30	158			30	138			30	155	12.4	55
950----	30	597	13.8	56	30	586			30	579			30	589	11.6	47
900----	30	1,048	11.5	51	30	1,040			30	1,038	17.2	26	30	1,034	8.3	50
850----	30	1,525	9.7	50	30	1,511			30	1,522	13.9	27	30	1,505	6.3	45
800----	30	2,026	7.7	45	30	2,009	6.1	40	30	2,029	10.0	29	30	2,000	4.2	43
750----	30	2,560	5.3	40	30	2,543	3.7	38	30	2,569	6.6	32	30	2,529	1.5	46
700----	30	3,116	2.7	33	30	3,092	.0	41	30	3,124	3.4	32	30	3,075	- 1.1	44
650----	30	3,717	- .6	33	30	3,683	- 3.6	43	30	3,727	- .3	30	30	3,669	- 4.3	43
600----	30	4,348	- 4.2		30	4,309	- 7.7	41	30	4,358	- 4.1	32	30	4,290	- 7.7	37
550----	30	5,028	- 8.4		30	4,981	-11.9	39	30	5,042	- 8.7	31	30	4.965	-11.2	33
500----	30	5,761	-13.2		30	5,705	-16.7	37	30	5,770	-13.6		30	5,687	-15.6	
450----	30	6,565	-18.7		30	6,492	-22.4	35	30	6,568	-19.8		30	6,482	-21.2	
400----	30	7,422	-25.2		30	7,341	-28.9	35	30	7,424	-26.5		30	7,333	-27.3	
350----	30	8,377	-32.8		30	8,280	-36.4		29	8,373	-34.3		30	8,279	-34.7	
300----	30	9,443	-40.9		30	9,330	-44.3		29	9,432	-42.1		29	9,332	-42.3	
250----	30	10,660	-48.7		29	10,527	-51.9		29	10,642	-50.1		29	10,544	-49.2	
200----	29	12,103	-55.2		29	11,949	-58.2		29	12,074	-57.0		29	11,986	-55.0	
175----	29	12,948	-57.9		29	12,785	-59.7		29	12,911	-60.2		29	12,835	-56.5	
150----	29	13,912	-61.2		29	13,747	-60.2		28	13,879	-63.1		28	13,806	-59.1	
125----	29	15,033	-64.7		29	14,880	-61.8		26	14,989	-66.5		27	14,940	-61.7	
100----	26	16,387	-67.1		28	16,250	-63.3		23	16,326	-69.1		27	16,315	-63.6	
80-----	19	17,736	-66.9		28	17,623	-62.7		19	17,659	-68.0		24	17,683	-62.9	
60-----	15	19,483	-63.1		24	19,394	-61.6		11	19,405	-65.7		20	19,465	-60.6	
50-----	14	20,608	-60.9		21	20,529	-60.7		11	20,515	-64.5		18	20,603	-60.2	
40-----	14	22,000	-59.2		19	21,920	-59.5		10	21,883	-61.7		17	21,995	-58.6	
30-----	10	23,794	-57.7		8	23,708	-58.4		6	23,665	-59.9		14	23,805	-57.6	

Standard pressure surface (mb.)	MAZATLAN, MEXICO (1011 MB.)				MEDFORD, ORE. (973 MB.)				MERIDA, MEXICO (1015 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	29	14	25.2	75	30	401	8.0	83	30	27	22.8	76
1,000--	29	113	24.5	75	30	169			30	154	22.3	74
950----	29	574	24.0	48	30	600	11.0	66	30	598	20.0	70
900----	29	1,034	21.6	42	30	1,046	10.0	55	30	1,063	17.0	68
850----	29	1,527	18.8	31	30	1,519	7.7	51	30	1,548	14.0	65
800----	29	2,044	15.7		30	2,017	5.1	49	30	2,058	12.0	53
750----	29	2,593	12.0		30	2,546	2.2	51	30	2,602	10.0	40
700----	29	3,162	8.4		30	3,096	- .7	49	30	3,167	7.3	33
650----	28	3,776	4.3		30	3,688	- 4.0	47	30	3,778	4.2	
600----	28	4,416	- .2		30	4,312	- 7.3	48	30	4,420	.8	
550----	26	5,111	- 4.7		30	4,987	-11.3	49	30	5,114	- 3.4	
500----	25	5,852	- 9.8		30	5,710	-15.6	47	30	5,861	- 8.0	
450----	24	6,662	-15.8		30	6,505	-20.5	41	30	6,680	-13.5	
400----	23	75,31	-22.0		30	7,359	-26.6	42	29	7,557	-19.3	
350----	21	8,504	-29.0		30	8,309	-33.9	41	29	8,533	-26.9	
300----	17	9,583	-37.5		30	9,370	-42.2		28	9,627	-35.5	
250----	13	10,826	-47.2		29	10,577	-50.9		28	10,867	-45.4	
200----					29	12,005	-57.5		26	12,315	-56.4	
175----					29	12,845	-58.4		20	13,150	-61.8	
150----					29	13,811	-59.9		17	14,094	-67.9	
125----					28	14,945	-62.0		14	15,177	-72.3	
100----					27	16,323	-63.3		11	16,468	-76.1	
80-----					26	17,696	-62.4		8	17,754	-75.0	
60-----					23	19,473	-61.1		7	19,463	-65.5	
50-----					23	20,606	-60.5		7	20,581	-61.5	
40-----					19	21,993	-58.8		7	21,971	-59.4	
30-----									5	23,757	-58.1	

Standard pressure surface (mb.)	MIAMI, FLA. (1017 MB.)				MIDLAND, TEX. (919 MB.)				NANTUCKET, MASS. (1016 MB.)				NASHVILLE, TENN. (998 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	4	20.0	77	30	871	11.4	44	30	14	7.7	79	30	177	7.8	78
1,000--	30	150	20.9	70	30	150			30	141	8.4	73	30	160	8.1	
950----	30	591	17.8	71	30	589			30	564	5.8	72	30	586	9.0	54
900----	30	1,053	14.7	67	30	1,045	14.7	34	30	1,005	3.2	70	30	1,031	6.1	55
850----	30	1,535	12.2	54	30	1,526	12.3	35	30	1,467	1.4	64	30	1,496	3.4	52
800----	30	2,041	10.3	42	30	2,032	10.0	34	30	1,954	.0	52	30	1,986	1.6	48
750----	30	2,583	8.0	38	30	2,571	7.3	30	30	2,477	- 1.6	46	30	2,510	- .7	43
700----	30	3,143	5.6	31	30	3,130	4.5	26	30	3,017	- 4.2	46	30	3,052	- 3.4	43
650----	30	3,747	2.3		30	3,733	.7	28	30	3,606	- 6.8	52	30	3,641	- 6.7	40
600----	29	4,387	- 1.3		30	4,367	- 3.4	28	29	4,215	-10.8	51	30	4,256	- 9.8	38
550----	29	5,076	- 5.5		29	5,049	- 7.8		29	4,887	-14.4	45	30	4,930	-13.2	34
500----	29	5,816	-10.4		29	5,783	-13.2		29	5,596	-19.0	45	30	5,643	-17.6	
450----	28	6,627	-16.0		29	6,583	-19.1		29	6,378	-24.2	43	30	6,431	-23.0	
400----	27	7,493	-22.6		29	7,442	-25.7		29	7,222	-30.0	41	30	7,275	-28.9	
350----	27	8,459	-29.5		29	8,395	-32.8		29	8,159	-36.6		30	8,217	-35.7	
300----	27	9,541	-37.5		29	9,461	-40.4		29	9,210	-43.8		30	9,271	-43.0	
250----	26	10,776	-46.5		29	10,681	-48.0		28	10,418	-50.1		30	10,482	-49.1	
200----	26	12,226	-55.7		29	12,127	-55.4		28	11,857	-54.8		30	11,928	-53.6	
175----	26	13,067	-60.6		29	12,970	-58.8		28	12,708	-56.0		30	12,783	-54.9	
150----	26	14,016	-65.2		27	13,931	-61.2		28	13,684	-57.2		30	13,762	-57.5	
125----	26	15,115	-69.1		26	15,049	-65.1		27	14,827	-58.2		28	14,912	-60.4	
100----	23	16,437	-72.6		21	16,396	-67.2		25	16,222	-59.8		26	16,296	-62.2	
80-----	19	17,744	-70.6		18	17,737	-66.6		23	17,615	-60.1		24	17,674	-61.8	
60-----	19	19,474	-65.0		16	19,483	-64.1		22	19,411	-59.4		19	19,458	-60.6	
50-----	19	20,591	-62.4		16	20,603	-62.2		21	20,554	-59.5		19	20,595	-59.3	
40-----	17	21,976	-59.7		12	21,986	-60.0		18	21,946	-59.3		11	22,005	-57.5	
30-----	10	23,786	-58.1		9	23,795	-57.5		14	23,768	-58.5		5	23,878	-54.5	

Standard pressure surface (mb.)	NORTH PLATTE, NEBR. (919 MB.)				OAKLAND, CALIF. (1019 MB.)				OKLAHOMA CITY, OKLA. (973 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	849	2.7	67	30	6	13.6	74	30	391	9.6	57
1,000--	30	151			30	167	14.2	68	30	159		
950----	30	579			30	600	14.1	54	30	592	12.6	44
900----	30	1,020	7.7	50	30	1,055	12.8	46	30	1,042	10.7	43
850----	30	1,491	6.6	43	30	1,534	10.8	38	30	1,516	8.5	41
800----	30	1,986	3.8	40	30	2,036	8.0	38	30	2,014	5.7	38
750----	30	2,510	.8	36	30	2,573	5.0	37	30	2,544	3.0	34
700----	30	3,058	- 2.5	35	30	3,126	1.8	37	30	3,095	.1	32
650----	30	3,647	- 5.9	37	30	3,728	- 1.6	38	30	3,690	- 3.4	34
600----	30	4,266	- 9.2	36	29	4,356	- 5.4	39	30	4,313	- 7.1	32
550----	29	4,936	-13.1	33	29	5,038	- 9.7	42	30	4,991	-11.0	35
500----	29	5,651	-18.1	32	29	5,762	-14.6	41	30	5,712	-15.7	33
450----	29	6,435	-23.6		29	6,563	-20.0	40	30	6,506	-21.4	32
400----	29	7,279	-30.1		29	7,415	-26.3	39	30	7,355	-27.7	
350----	29	8,214	-37.4		29	8,365	-33.7	39	30	8,300	-34.3	
300----	29	9,260	-44.9		29	9,428	-41.9		30	9,361	-41.7	
250----	29	10,457	-51.9		29	10,637	-50.5		30	10,574	-49.3	
200----	29	11,883	-57.1		29	12,067	-57.3		29	12,011	-55.8	
175----	29	12,726	-58.0		29	12,904	-60.0		29	12,856	-57.9	
150----	29	13,693	-59.7		26	13,855	-61.4		29	13,823	-59.9	
125----	28	14,830	-61.6		19	14,985	-63.6		28	14,957	-62.5	
100----	24	16,203	-63.2		8	16,333	-66.8		28	16,324	-64.8	
80-----	22	17,568	-62.9						27	17,684	-63.9	
60-----	21	19,343	-61.2						21	19,455	-62.2	
50-----	20	20,474	-60.4						13	20,593	-61.3	
40-----	15	21,872	-60.1						10	21,976	-60.0	
30-----	8	23,694	-59.3						5	23,758	-57.7	

Standard pressure surface (mb.)	OMAHA, NEBR. (969 MB.)				PHOENIX, ARIZ. (976 MB.)				PITTSBURGH, PA. (976 MB.)				PORTLAND, ME. (1015 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	300	6..1	65	30	338	18.4	38	30	382	4.5	77	30	20	2.7	81
1,000--	30	144			30	133			30	150			30	138	4.3	71
950----	30	570	8.2	54	30	582	22.3	20	30	571	4.5	72	30	556	2.8	68
900----	30	1,013	6.6	50	30	1,044	19.4	21	30	1,008	1.9	72	30	991	.7	68
850----	30	1,480	3.9	50	30	1,532	16.0	24	30	1,467	- .3	68	30	1,448	- 1.3	64
800----	30	1,971	1.8	45	30	2,043	12.3	27	30	1,951	- 2.1	60	30	1,930	- 3.4	56
750----	30	2,495	- .7	44	30	2,586	8.4	27	30	2,467	- 4.3	56	30	2,444	- 5.7	53
700----	30	3,036	- 3.8	43	30	3,146	5.0		30	3,003	- 6.8	52	30	2,977	- 7.8	50
650----	30	3,623	- 7.2	39	30	3,755	1.6		30	3,583	- 9.7	45	30	3,558	-10.2	43
600----	30	4,237	-10.7	38	30	4,386	- 2.4		30	4,193	-13.0		30	4,163	-13.5	44
550----	30	4,904	-14.4	41	29	5,071	- 7.3		30	4,854	-17.2		30	4,822	-17.4	48
500----	30	5,618	-19.0	40	29	5,805	-12.6		30	5,559	-22.1		30	5,528	-21.9	49
450----	30	6,399	-24.5		28	6,611	-18.7		30	6,329	-27.5		30	6,302	-27.0	45
400----	30	7,239	-30.9		28	7,469	-25.5		30	7,163	-33.0		30	7,135	-32.7	
350----	30	8,171	-38.1		28	8,422	-33.2		30	8,090	-39.0		28	8,058	-39.2	
300----	30	9,215	-44.6		27	9,494	-41.2		30	9,131	-45.6		28	9,099	-45.2	
250----	30	10,416	-51.1		26	10,707	-48.8		30	10,330	-50.7		28	10,303	-49.8	
200----	30	11,849	-55.3		24	12,152	-56.4		30	11,773	-53.7		28	11,746	-53.8	
175----	30	12,698	-56.3		23	12,986	-59.2		30	12,628	-54.7		28	12,602	-54.7	
150----	30	13,671	-57.8		23	13,944	-62.5		29	13,621	-56.5		28	13,585	-56.2	
125----	29	14,814	-60.0		21	15,059	-66.0		27	14,763	-59.0		28	14,738	-58.0	
100----	28	16,205	-62.3		20	16,405	-68.0		23	16,153	-60.3		27	16,141	-59.6	
80-----	26	17,577	-61.5		20	17,745	-67.0		13	17,558	-59.8		25	17,534	-59.5	
60-----	26	19,359	-60.8		19	19,492	-64.1		7	19,331	-59.6		21	19,325	-59.3	
50-----	24	20,485	-60.8		16	20,620	-62.2		5	20,480	-60.6		19	20,462	-60.1	
40-----	22	21,878	-59.7		12	21,998	-60.8						11	21,868	-60.3	
30-----	8	23,701	-58.3		5	23,842	-57.6						6	23,707	-58.5	
20-----																

Standard pressure surface (mb.)	RAPID CITY, S. DAK. (906 MB.)				ST. CLOUD, MINN. (977 MB.) .				SAN ANTONIO, TEX. (991 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	966	4.3	58	30	316	1.4	74	30	243	14.7	56
1,000--	30	146			30	127			30	164		
950----	30	574			30	547	2.5	66	30	603	16.5	45
900----	30	1,019	6.5	51	30	979	1.1	62	30	1,059	13.6	48
850----	30	1,488	6.4	45	30	1,437	- .5	60	30	1,538	11.2	49
800----	30	1,983	3.5	45	30	1,920	- 2.0	58	30	2,043	9.2	44
750----	30	2,507	.5	42	30	2,440	- 3.8	49	30	2,581	6.8	35
700----	30	3,054	- 2.6	41	30	2,973	- 6.4	42	30	3,138	3.8	33
650----	30	3,644	- 5.7	38	30	3,556	- 9.7	39	30	3,741	.5	33
600----	30	4,263	- 9.1	37	30	4,163	-12.9	33	30	4,375	- 3.2	
550----	30	4,932	-13.2	35	30	4,827	-17.4		30	5,061	- 7.5	
500----	30	5,650	-18.2	33	30	5,529	-21.9		30	5,794	-12.6	
450----	30	6,438	-24.0	33	30	6,304	-27.0		30	6,597	-18.7	
400----	29	7,272	-30.6	36	30	7,136	-32.9		30	7,456	-25.5	
350----	29	8,206	-37.8		30	8,062	-39.5		30	8,410	-32.8	
300----	29	9,252	-44.6		30	9,101	-46.1		30	9,478	-40.6	
250----	28	10,455	-51.3		30	10,295	-51.9		30	10,699	-48.3	
200----	28	11,885	-56.4		30	11,729	-54.5		26	12,149	-55.6	
175----	27	12,728	-57.6		30	12,584	-54.2		26	12,993	-59.0	
150----	27	13,698	-58.4		30	13,568	-55.4		26	13,951	-62.4	
125----	27	14,839	-59.9		30	14,726	-56.8		23	15,059	-65.0	
100----	25	16,224	-60.8		29	16,129	-58.4		23	16,407	-68.4	
80-----	25	17,611	-60.9		28	17,525	-58.4		20	17,743	-67.4	
60-----	23	19,411	-60.0		24	19,322	-58.3		19	19,491	-63.5	
50-----	22	20,552	-59.6		22	20,469	-58.6		18	20,619	-61.6	
40-----	21	21,946	-59.1		14	21,875	-58.3		14	22,006	-59.1	
30-----	15	23,760	-57.3		7	23,679	-58.8		10	23,832	-57.6	
20-----	7	26,323	-56.1						5	26,436	-53.3	

These average values for standard pressure surfaces were ohtained by radiosondee; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

NOVEMBER 1954

Standard pressure surface (mb.)	SAN JUAN, P. R. (1013 MB.)				SANTA MARIA, CALIF. (1010 MB.)				S. STE. MARIE, MICH. (989 MB.)				SPOKANE, WASH. (935 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	19	24.4	84	30	74	13.8	72	30	221	2.0	83	30	722	5.4	84
1,000--	30	133	24.5	78	30	154	15.2	63	30	126	.8		30	166		
950----	30	590	21.8	78	30	592	15.9	47	30	544	1.0	77	30	593		
900----	30	1,051	18.7	79	30	1,048	14.5	38	30	974	- 1.3	77	30	1,034	6.3	69
850----	30	1,540	15.8	75	30	1,529	12.7	33	30	1,428	- 3.2	74	30	1,501	4.5	63
800----	30	2,053	13.1	72	30	2,035	9.9	31	30	1,906	- 5.0	64	30	1,993	2.1	59
750----	30	2,602	10.8	58	30	2,570	6.7	35	30	2,420	- 6.6	56	30	2,516	- .7	61
700----	30	3,167	7.8	51	30	3,131	3.5	33	30	2,948	- 9.0	50	30	3,060	- 3.7	59
650----	30	3,783	4.1	46	30	3,732	.2	33	30	3,525	-12.2	50	30	3,645	- 6.8	55
600----	30	4,422	.5	42	30	4,366	- 4.0	31	30	4,126	-15.8	51	30	4,263	-10.3	53
550----	30	5,119	- 3.0	33	30	5,049	- 8.0	28	30	4,780	-19.5	50	30	4,929	-14.3	54
500----	30	5,865	- 7.1	29	30	5,781	-13.2		30	5,480	-23.9	50	30	5,644	-18.8	53
450----	29	6,691	-12.1		30	6,582	-19.2		28	6,259	-28.5	51	30	6,425	-24.4	52
400----	29	7,570	-18.0		30	7,439	-26.1	31	27	7,098	-34.4	53	30	7,267	-30.4	54
350----	29	8,552	-25.4		30	8,390	-33.3		26	8,028	-40.8		30	8,202	-37.1	49
300----	29	9,650	-34.0		30	9,454	-41.6		24	9,066	-47.8		30	9,250	-44.6	
250----	29	10,899	-43.6		30	10,667	-50.0		12	10,204	-50.7		30	10,448	-52.2	
200----	29	12,361	-55.1		30	12,101	-56.6		6	11,631	-46.5		30	11,872	-57.5	
175----	29	13,200	-61.4		30	12,942	-59.3		6	12,513	-48.4		26	12,708	-57.7	
150----	29	14,139	-68.1		30	13,900	-62.1						24	13,702	-57.9	
125----	29	15,216	-73.8		30	15,019	-65.0						14	14,884	-59.9	
100----	28	16,499	-77.3		29	16,366	-68.0									
80-----	22	17,775	-76.4		27	17,717	-66.9									
60-----	17	19,471	-66.7		24	19,465	-64.6									
50-----	17	20,585	-62.6		21	20,587	-63.1									
40-----	15	21,963	-60.7		18	21,972	-60.9									
30-----	13	23,753	-58.6		9	23,770	-58.6									
20-----	6	26,336	-50.7													

Standard pressure surface (mb.)	SWAN ISLAND, W. I. (1014 MB.)				TACUBAYA, MEXICO (775 MB.)				TAMPA, FLA. (1018 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	10	25.5	80	29	2,306	14.8	55	30	9	16.2	83
1,000--	30	131	25.1	79	29	81			30	159	17.5	76
950----	30	582	21.9	81	29	544			30	601	15.3	72
900----	30	1,049	18.8	82	29	1,020			30	1,054	13.2	63
850----	30	1,538	15.9	82	29	1,506			30	1,533	11.0	56
800----	30	2,051	13.1	78	29	2,034			30	2,037	9.0	49
750----	30	2,598	10.7	70	29	2,584	13.2	51	30	2,577	6.7	44
700----	29	3,165	8.0	62	29	3,155	8.6	53	30	3,134	4.3	35
650----	29	3,780	4.7	58	29	3,767	3.8	61	30	3,739	1.3	30
600----	29	4,422	1.3	43	29	4,409	- .8	63	30	4,375	- 2.1	26
550----	29	5,120	- 2.2	34	29	5,102	- 4.4	47	29	5,060	- 6.3	
500----	28	5,870	- 6.3		28	5,845	- 8.8		29	5,799	-11.2	
450----	28	6,699	-11.5		26	6,663	-13.9		29	6,608	-16.9	
400----	28	7,579	-17.8		24	7,541	-20.2		29	7,474	-23.2	
350----	28	8,564	-25.0		22	8,516	-27.6		29	8,437	-30.2	
300----	28	9,664	-33.5		18	9,609	-36.2		28	9,516	-38.2	
250----	28	10,916	-43.5		15	10,853	-46.2		28	10,746	-46.8	
200----	27	12,377	-55.1		12	12,296	-57.2		26	12,197	-54.8	
175----	27	13,216	-61.5		12	13,129	-63.1		26	13,042	-59.0	
150----	24	14,156	-67.5		9	14,061	-67.0		26	13,998	-63.2	
125----	18	15,239	-72.9		9	15,145	-72.1		26	15,108	-66.9	
100----	11	16,527	-77.8		7	16,451	-76.3		26	16,447	-69.2	
80-----	7	17,796	-76.1		5	17,725	-76.4		24	17,779	-68.0	
60-----	7	19,499	-64.5		5	19,414	-67.9		22	19,526	-63.1	
50-----	7	20,620	-61.8		5	20,524	-63.1		21	20,650	-61.5	
40-----	6	22,005	-60.3						21	22,041	-59.4	
30-----									15	23,860	-57.1	
20-----									8	26,481	-53.2	

	TATOOSH ISLAND, WASH. (1012 MB.)				VERACRUZ, MEXICO (1015 MB.)				WASHINGTON, D. C. (1008 MB.)			
SURFACE	29	31	10.5	88	21	13	24.5	70	30	88	6.1	75
1,000--	29	126	10.4	83	21	140	23.4	71	30	154	6.9	66
950----	29	557	8.5	79	21	588	19.8	73	30	579	5.9	65
900----	29	998	6.2	77	21	1,050	16.7	68	30	1,017	3.6	67
850----	29	1,465	3.4	77	21	1,536	14.2	66	30	1,479	1.4	64
800----	29	1,955	1.2	71	21	2,045	11.9	60	30	1,966	- .6	59
750----	29	2,478	- 1.2	62	21	2,593	9.5	51	30	2,490	- 2.3	54
700----	29	3,019	- 4.3	60	21	3,154	6.7		30	3,025	- 4.4	47
650----	29	3,604	- 7.4	56	21	3,764	3.4		30	3,612	- 7.5	43
600----	29	4,220	-11.2	56	21	4,405	.3		30	4,225	-11.1	40
550----	29	4,884	-15.8	53	21	5,100	- 3.5		30	4,892	-15.0	
500----	29	5,596	-19.9	51	19	5,849	- 8.1		30	5,602	-19.9	
450----	29	6,377	-25.0	46	19	6,669	-13.3		30	6,385	-25.2	
400----	28	7,219	-30.6	45	19	7,548	-19.3		30	7,220	-31.3	
350----	28	8,153	-37.5		19	8,526	-26.6		30	8,152	-38.1	
300----	28	9,200	-44.7		19	9,620	-35.3		30	9,197	-44.8	
250----	28	10,397	-52.1		19	10,863	-45.3		30	10,399	-50.1	
200----	28	11,822	-56.7		19	12,314	-56.4		30	11,842	-54.0	
175----	26	12,666	-57.6		17	13,154	-61.9		29	12,687	-55.4	
150----	24	13,627	-56.6		15	14,098	-67.4		29	13,665	-57.7	
125----	22	14,760	-56.5		13	15,180	-71.4		25	14,789	-60.2	
100----	20	16,164	-57.1		12	16,485	-75.2		23	16,172	-60.4	
80-----	17	17,564	-57.1		9	17,770	-73.8		22	17,553	-61.0	
60-----	16	19,397	-56.5		8	19,480	-65.0		20	19,346	-59.8	
50-----	12	20,542	-55.7		7	20,612	-61.2		20	20,483	-60.0	
40-----	9	21,961	-55.0		6	21,988	-60.5		17	21,869	-59.8	
30-----	7	23,789	-53.0						13	23,678	-58.8	
20-----									8	26,208	-58.1	
15-----									5	27,950	-57.1	

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20 *Air Force Data for July 1954

Standard pressure surface (mb.)	DENVER, COLO. (836 MB.)				FT. WORTH, TEX. (991 MB.)				OGDEN, UTAH (854 MB.)				RANTOUL, ILL. (988 MB.)				ROME, N. Y. (994 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,661	23.8	40	31	178	32.9	42	31	1,450	26.5	30	30	227	24.0	67	30	146	16.6	76
1,000--	31	51			31	94			31	28			30	121			30	102		
950----	31	518			31	562	31.5	40	31	501			30	576	24.7	58	30	543	18.0	66
900----	31	1,005			31	1,041	27.6	45	31	986			30	1,045	22.0	56	30	1,003	15.2	66
850----	31	1,509			31	1,544	23.3	52	31	1,491	26.6	34	30	1,539	18.7	57	30	1,485	11.7	70
800----	31	2,040	23.2	39	31	2,069	18.7	60	31	2,024	23.7	31	30	2,057	15.7	56	30	1,990	8.1	68
750----	31	2,603	19.3	42	31	2,623	14.1	67	31	2,590	19.3	33	30	2,608	13.0	53	30	2,525	5.2	60
700----	31	3,188	14.5	48	31	3,199	10.2	61	31	3,171	14.5	36	30	3,180	9.5	50	30	3,080	2.2	59
650----	31	3,809	9.2	58	31	3,814	6.5	53	31	3,795	9.3	41	30	3,795	5.7	48	30	3,676	- .9	53
600----	31	4,468	3.9	68	31	4,464	2.5	48	31	4,449	3.8	47	30	4,441	1.5	47	30	4,312	- 4.2	44
550----	31	5,171	- 1.3	75	31	5,166	- 1.7	40	31	5,149	- 2.0	54	30	5,137	- 2.9	45	30	4,993	- 8.3	44
500----	31	5,923	- 6.3	74	31	5,915	- 6.3	40	31	5,900	- 7.3	50	30	5,885	- 7.5	38	30	5,727	-12.6	36
450----	31	6,753	-11.5	67	31	6,741	-11.7	36	31	6,725	-12.7	44	29	6,707	-12.5		30	6,524	-18.0	
400----	31	7,634	-17.3	57	31	7,624	-17.7		31	7,602	-18.9	40	29	7,586	-18.6	34	30	7,393	-24.5	
350----	30	8,619	-24.3	53	31	8,609	-24.7		31	8,582	-25.8	42	29	8,567	-25.8	36	30	8,350	-31.9	
300----	29	9,720	-32.9		30	9,710	-33.3		31	9,679	-34.1		29	9,664	-34.2		30	9,420	-39.9	
250----	29	10,975	-43.0		30	10,965	-43.1		31	10,929	-43.9		28	10,913	-44.1		30	10,641	-48.1	
200----	28	12,441	-54.9		29	12,430	-54.4		31	12,390	-55.0		28	12,374	-55.3		30	12,091	-53.5	
175----	28	13,282	-60.8		29	13,273	-60.4		31	13,231	-60.4		28	13,214	-60.7		28	12,946	-55.4	
150----	28	14,227	-66.7		24	14,227	-66.4		31	14,180	-65.0		28	14,162	-65.1		23	13,929	-57.4	
125----	25	15,310	-70.4		21	15,321	-70.9		28	15,280	-67.9		25	15,262	-68.4		22	15,076	-58.1	
100----	15	16,626	-68.8		7	16,636	-69.7		22	16,629	-65.7		16	16,622	-66.4		17	16,470	-57.6	
80-----	10	17,970	-63.9						17	17,995	-61.3		12	17,978	-62.7		15	17,886	-56.6	
60-----	9	19,752	-57.9						15	19,798	-56.4		10	19,772	-57.5		10	19,731	-54.1	
50-----	8	20,905	-56.0						15	20,960	-54.9		8	20,926	-55.1		9	20,898	-53.5	
40-----	8	22,328	-53.9						13	22,395	-52.3		6	22,356	-52.9		8	22,334	-51.6	
30-----	7	24,190	-50.1						10	24,273	-49.3						5	24,234	-49.1	

* August data for the above Air Force stations will be included in the December issue of this publication.

Note: All observations scheduled at 0300, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Table 21

NOVEMBER 1954

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)			Buffalo, N. Y. (182 m.)			Burlington, Vt. (100 m.)			Charleston, S. C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)			Ely, Nev. (1,910 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	29	242	1.2	30	302	1.4	29	263	3.4	30	295	2.8	30	89	0.3	30	95	0.7	30	231	1.8	26	186	1.7	30	282	0.7	29	229	1.7	30	289	1.4	29	132	0.1
500	--	---	----	--	---	----	--	---	----	--	---	----	--	---	----	30	43	1.1	30	253	4.9	26	203	3.8	30	275	1.6	29	246	2.9	--	---	----	--	---	----
1,000	28	237	1.0	--	---	----	--	---	----	28	288	5.1	30	99	.7	23	332	2.0	30	264	7.4	23	230	5.7	27	255	2.6	25	250	3.8	--	---	----	--	---	----
1,500	28	274	2.0	--	---	----	29	260	6.4	27	293	7.5	30	178	1.3	18	21	6.0	30	264	8.1	20	256	8.3	25	262	3.3	18	262	3.9	30	257	1.8	--	---	----
2,000	26	282	4.4	30	280	2.4	29	279	8.3	25	299	10.3	29	231	2.2	18	304	7.7	30	267	7.8	16	256	9.3	25	272	5.8	18	273	5.3	30	261	2.6	29	302	.1
2,500	24	290	7.4	30	293	4.3	29	293	9.4	25	305	11.9	29	256	4.5	18	305	9.4	29	274	8.6	11	269	13.2	20	276	7.3	17	282	6.1	30	280	4.4	29	247	.6
3,000	24	299	8.8	30	300	5.3	27	286	10.3	25	306	12.5	27	253	7.0	15	299	10.1	28	279	9.7	11	270	15.1	19	279	9.4	15	292	6.7	30	289	6.2	27	274	1.3
4,000	24	293	10.1	29	297	7.6	20	297	10.9	25	305	15.5	22	255	5.9	13	296	9.9	28	275	10.7				16	270	10.0	12	289	8.6	29	292	7.7	25	263	2.6
5,000	24	294	11.9	29	292	10.4	18	301	11.6	22	308	17.5	20	265	6.4	11	284	11.4	26	276	13.4				12	257	12.1	10	305	6.7	29	291	8.4	23	274	5.8
6,000	23	295	12.5	29	294	11.5	15	290	12.5	16	317	22.3	18	266	7.3				25	273	15.7				11	256	14.6	10	301	7.8	28	294	9.8	22	284	7.8
8,000	19	297	15.3	26	294	10.0							16	285	10.0				23	268	17.3							10	297	10.1	25	293	8.7	16	294	6.6
10,000	13	304	15.6	18	335	8.7							11	309	14.2				19	273	22.1										20	305	8.9			
12,000				10	318	15.1													16	279	22.6										20	300	11.9			
14,000																			12	267	19.3										16	286	15.6			
16,000																															10	276	14.4			

	Grand Junction, Colo. (1,475 m.)			Green Bay, Wis. (210 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Little Rock, Ark. (88 m.)			Medford, Ore. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			** Oakland, Calif. (8 m.)			Omaha, Nebr. (306 m.)		
Surface	29	276	1.0	27	260	1.9	25	275	1.4	30	270	3.3	29	333	0.9	29	332	0.5	28	155	0.4	30	53	0.7	28	322	1.0	29	263	1.4	30	249	1.6	30	290	2.1
500	--	---	----	27	263	2.8	25	278	2.1	--	---	----	29	290	.5	29	289	1.4	28	180	.6	30	42	1.5	27	263	1.0	29	263	1.6	30	145	.2	30	291	2.7
1,000	--	---	----	24	263	5.7	24	282	3.8	30	270	6.6	28	246	2.5	28	297	2.2	28	160	2.2	30	8	1.0	27	306	2.1	26	249	3.1	30	216	.8	30	290	4.6
1,500	29	282	1.1	19	266	8.3	23	287	4.6	30	274	9.6	26	254	4.6	26	305	2.8	27	197	3.5	28	272	2.4	22	326	4.2	24	261	4.1	30	244	2.3	28	287	6.3
2,000	29	283	.9	15	271	11.0	20	290	6.6	27	279	10.7	23	270	6.4	25	300	5.5	27	216	6.2	28	255	3.9	20	313	5.3	20	273	5.3	30	245	3.5	27	286	7.9
2,500	29	276	1.1	13	282	13.7	18	282	7.8	26	282	11.8	21	273	7.5	25	292	6.7	24	231	7.6	27	265	5.5	16	303	5.5	18	279	6.9	30	252	3.9	26	303	9.4
3,000	28	283	2.8	11	287	15.3	17	283	9.2	22	285	11.6	19	259	10.5	23	299	8.1	21	246	6.8	26	272	7.5	16	291	7.9	18	285	7.1	30	250	4.5	25	308	9.7
4,000	25	303	5.0	10	286	15.5	14	287	10.6	16	296	13.8	16	259	11.9	22	296	11.1	16	252	7.0	21	262	8.6	14	304	7.2	16	294	7.3	30	258	6.9	24	309	9.9
5,000	25	305	6.8				12	286	9.1	12	296	15.4	15	263	15.2	18	300	8.5	15	265	6.7	19	261	12.0	12	292	8.6	16	298	9.3	30	257	9.0	23	311	12.2
6,000	24	309	8.9				10	284	6.6				12	264	16.2	17	300	7.6	14	268	9.9	17	264	13.9				14	285	12.6	30	256	10.2	21	315	15.4
8,000	23	324	11.9																10	253	10.8	14	265	22.7				11	293	15.2	30	257	10.7	16	337	17.5
10,000	16	325	8.5																												30	262	12.1	13	318	16.1
12,000	13	314	11.8																												26	252	15.2	11	301	17.6
14,000																															26	251	14.8			
16,000																															20	256	10.6			

	Phoenix, Ariz. (345 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			* Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (725 m.)			# Washington, D. C. (88 m.)		
Surface	30	214	0.5	30	327	3.2	28	287	1.8	27	270	1.1	29	315	0.5	30	266	2.5	30	270	0.7	28	208	1.8	30	270	1.1
500	30	195	.7	--	---	----	28	294	2.5	27	269	3.0	29	5	1.0	30	286	2.2	30	240	1.8	--	---	----	30	264	2.5
1,000	30	159	.9	30	328	3.4	22	271	3.6	25	271	3.9	29	355	.7	30	41	.1	30	256	3.5	28	211	3.3	30	270	4.0
1,500	30	157	1.2	30	317	6.0	17	262	6.3	20	281	5.2	26	321	1.9	28	49	1.1	30	270	5.8	23	225	6.7	30	270	6.1
2,000	30	181	1.1	28	308	6.5	17	272	8.0	18	286	6.5	25	297	3.3	28	1	.6	30	274	7.9	20	235	7.3	30	271	7.8
2,500	29	266	1.3	26	304	8.5	17	285	8.4	17	285	7.2	23	294	5.0	28	330	1.5	30	279	8.6	16	255	6.9	30	268	9.9
3,000	28	275	2.9	26	303	11.6	17	288	9.8	16	292	7.3	23	298	7.0	27	313	3.0	30	274	10.0	15	253	8.3	30	263	10.8
4,000	27	289	3.9	22	309	12.5	16	282	14.5	15	299	10.2	21	300	10.0	24	289	3.9	30	277	12.0	13	258	11.1	30	261	12.7
5,000	26	298	6.6	20	309	15.3	14	293	16.4	15	297	11.1	17	305	9.4	21	268	5.7	29	285	13.9	12	256	12.5	30	258	15.4
6,000	24	290	7.0	17	303	16.5	13	296	20.1	13	298	12.3	15	307	9.8	21	258	5.6	29	288	14.9				30	258	17.4
8,000	14	308	4.0	14	311	17.0										17	266	3.3	26	288	19.5				30	253	26.1
10,000	10	305	3.9													14	5	2.0	19	284	21.0				30	254	29.2
12,000																11	14	3.2	12	255	17.6				29	255	28.4
14,000																									27	253	22.3
16,000																									25	254	19.4

* Rawin Data

** Rawin Data (Cont'd.)

18,000 m., 19 obs., 282 dir., 4.9 speed
20,000 m., 18 obs., 117 dir., .8 speed
22,000 m., 15 obs., 61 dir., 2.6 speed

Rawin Data (Cont'd.)

18,000 m., 15 obs., 277 dir., 11.0 speed

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

RAWIN DATA

Average monthly resultant winds

Table 22

NOVEMBER 1954

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Buffalo, N. Y. (182 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface--------	30	83	0.7	30	317	1.5	30	74	1.1	30	239	0.9	30	17	2.1	30	248	2.2
500------------	--	---	----	--	---	----	30	104	2.3	30	239	4.7	29	357	2.7	30	255	3.9
1,000----------	--	---	----	30	309	6.4	28	92	.7	29	255	6.7	25	332	2.1	30	261	6.0
1,500----------	--	---	----	30	316	8.5	28	319	2.2	29	262	7.3	25	315	3.6	30	264	7.1
2,000----------	30	294	3.1	29	310	9.6	27	329	4.2	29	264	7.7	26	310	4.1	29	267	9.1
2,500----------	30	301	4.2	28	309	10.8	27	318	5.3	28	272	7.7	25	283	5.4	28	266	10.7
3,000----------	30	291	4.7	28	307	12.0	27	306	6.5	26	268	8.2	25	281	8.5	28	264	12.7
4,000----------	29	303	5.7	26	305	14.1	21	301	7.4	25	260	8.7	24	278	10.5	23	268	12.8
5,000----------	28	308	6.5	21	303	15.6	20	289	9.2	25	261	10.0	23	273	12.4	20	257	13.4
6,000----------	26	326	7.5	18	301	16.8	19	291	9.4	25	261	12.8	20	271	14.5	29	255	18.1
8,000----------	24	339	11.1	16	286	21.2	16	276	14.1	22	257	15.1	18	265	19.8	15	254	21.1
10,000---------	22	337	14.2	10	285	24.8	14	274	20.5	21	261	19.0	13	263	18.2	10	253	25.0
12,000---------	18	321	11.3				12	276	24.8	18	273	17.4						
14,000---------	16	301	12.9							13	271	20.9						
16,000---------	14	299	10.0															
18,000---------																		
20,000---------																		
22,000---------																		
24,000---------																		

Altitude (meters) m.s.l.	Charleston, S. C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N. C. (275 m.)			Hatteras, N. C. (3 m.)			Int. Falls, Minn. (358 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface--------	30	330	0.5	30	215	0.6	30	86	0.5	28	319	1.0	28	301	2.9	29	272	1.8
500------------	30	269	1.1	30	238	2.1	--	---	----	28	294	1.8	27	317	2.8	29	266	2.1
1,000----------	29	257	1.8	30	278	5.1	--	---	----	27	289	2.8	26	287	2.4	29	280	4.0
1,500----------	29	246	4.5	30	289	6.5	29	73	.6	27	291	3.9	26	251	4.6	29	293	5.7
2,000----------	29	260	6.4	30	294	7.8	29	307	1.5	27	274	4.8	25	258	6.5	29	301	7.4
2,500----------	28	260	6.8	29	296	8.2	29	266	1.2	27	267	5.9	24	249	6.9	29	301	7.6
3,000----------	27	258	8.5	29	300	9.9	30	289	2.3	27	262	7.3	23	256	6.6	29	303	8.5
4,000----------	24	261	10.1	29	298	10.9	30	288	5.2	27	258	9.4	23	247	11.0	29	301	11.1
5,000----------	20	263	10.9	29	304	13.8	30	292	7.8	25	250	0.9	21	238	13.1	29	300	13.4
6,000----------	20	268	11.4	28	301	17.6	28	313	10.3	23	259	9.1	19	249	11.8	29	305	15.8
8,000----------	13	248	14.0	27	295	23.8	22	306	11.1	19	262	11.2	14	268	9.4	27	318	24.2
10,000---------	12	265	21.3	25	298	23.1	19	314	9.9	17	279	16.1	12	277	14.1	27	315	30.3
12,000---------				24	304	21.1	13	313	8.1	14	271	16.7	11	285	19.9	25	312	26.8
14,000---------				21	295	18.8	13	294	10.1							24	313	21.1
16,000---------				19	301	13.1	11	285	10.0							22	312	14.8
18,000---------				17	295	6.4										20	313	11.3
20,000---------				17	329	4.4										13	318	9.7
22,000---------				15	288	4.6										10	319	11.0
24,000---------				13	281	5.2												

Altitude (meters) m.s.l.	Little Rock, Ark. (80 m.)			Medford, Ore. (401 m.)			Miami, Fla. (4 m.)			Midland, Tex. (871 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface--------	30	300	0.6	30	172	0.8	30	20	1.3	30	165	0.8	29	248	1.0	30	247	0.7
500------------	30	322	.7	29	161	1.2	30	57	1.7	--	---	----	29	241	4.0	28	238	1.7
1,000----------	30	318	2.2	29	179	2.6	30	83	1.1	30	174	1.2	27	246	4.0	28	276	2.4
1,500----------	30	310	3.0	29	191	3.4	30	237	1.5	30	232	1.7	27	250	6.5	28	284	3.0
2,000----------	28	305	4.4	29	216	5.4	30	256	2.3	30	266	3.7	26	250	9.0	28	288	4.1
2,500----------	26	306	5.7	30	228	6.9	30	249	3.8	30	285	5.0	26	246	10.6	29	299	5.4
3,000----------	25	303	7.1	30	237	7.6	30	251	5.4	30	297	6.3	26	246	14.2	29	291	6.8
4,000----------	23	296	9.0	29	249	9.0	29	253	8.9	30	306	7.7	22	250	16.6	29	291	8.5
5,000----------	21	304	9.3	27	264	9.5	29	256	10.5	28	297	7.9	20	250	20.2	27	291	9.6
6,000----------	18	297	7.2	22	248	9.4	27	260	13.1	28	298	8.9	15	251	21.4	24	283	7.6
8,000 ---------	14	278	7.0	19	246	8.8	25	266	20.7	26	286	10.8				19	280	8.7
10,000---------	11	262	5.5	16	238	9.7	23	261	29.0	20	288	11.9				18	267	12.5
12,000---------				14	271	10.4	16	262	28.3	18	303	15.8				15	279	13.1
14,000---------				11	277	10.4	13	258	22.1	16	294	13.1				15	277	10.7
16,000---------				10	298	9.3	11	256	14.9	14	304	10.8				13	284	10.2
18,000---------										12	308	4.5				10	282	7.1
20,000---------																		
22,000---------																		
24,000---------																		

Altitude (meters) m.s.l.	Oakland, Calif. (8 m.)			Oklahoma, City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			St. Cloud, Minn. (318 m.)			San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface--------	30	191	0.4	30	151	0.6	30	315	2.5	30	303	1.4	30	22	0.7	30	137	2.1
500------------	30	358	.4	29	175	.7	--	---	----	30	292	2.5	30	73	2.2	30	91	6.4
1,000----------	30	249	.8	29	238	1.4	30	310	2.9	30	297	5.8	29	342	.4	30	88	6.9
1,500----------	30	237	1.9	29	295	4.3	30	315	7.3	29	292	7.2	29	290	3.0	30	85	6.1
2,000----------	30	248	2.7	30	308	6.1	30	311	8.3	29	301	8.0	29	298	4.2	30	78	5.9
2,500----------	30	264	3.4	30	317	7.2	30	316	9.3	29	304	8.8	29	301	4.6	30	76	4.9
3,000----------	30	273	4.1	29	311	7.6	30	314	12.0	29	302	10.3	29	300	6.0	30	83	4.3
4,000----------	29	276	5.7	29	311	9.6	27	307	12.3	27	300	11.8	29	298	8.5	30	77	2.5
5,000----------	29	274	7.7	28	305	11.5	22	295	13.0	26	302	13.5	30	291	10.2	30	45	1.4
6,000----------	29	273	8.8	26	310	9.9	19	281	15.0	26	306	15.2	30	301	10.8	29	2	2.4
8,000 ---------	29	265	7.9	22	305	10.1	13	271	17.1	26	315	18.9	27	277	14.7	29	325	7.0
10,000---------	29	283	9.8	16	314	5.1				17	310	21.7	22	289	15.9	29	315	11.9
12,000---------	29	277	12.4	14	302	6.7				13	310	19.5	16	274	22.8	30	297	17.5
14,000---------	26	279	14.7	13	306	10.1				12	301	17.1	13	284	27.2	30	288	16.6
16,000---------				14	286	8.6				12	303	12.5				30	297	7.9
18,000---------				13	269	7.0				12	302	8.3				20	65	3.0
20,000---------										10	320	7.4				18	89	5.5
22,000---------																16	94	5.4
24,000---------																12	92	5.0

Altitude (meters) m.s.l.	Santa Maria, Calif. (72 m.)			Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is., Wash. (33 m.)			Washington, D. C. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface--------	30	359	0.7	30	104	0.5	30	201	1.5	29	146	3.8	30	293	0.5
500------------	29	23	3.6	29	195	.8	--	---	----	27	158	9.0	30	276	3.0
1,000----------	29	30	3.7	29	263	3.6	30	208	4.2	27	179	9.7	30	277	4.7
1,500----------	29	35	3.4	29	264	5.1	30	229	6.0	27	189	10.2	30	273	5.0
2,000----------	29	17	1.8	29	273	7.0	30	239	6.1	27	202	11.0	30	269	6.2
2,500----------	29	322	1.8	29	275	7.5	30	252	7.3	27	205	11.4	30	270	8.0
3,000----------	28	291	3.4	29	270	9.4	30	259	8.9	27	209	13.2	30	263	9.6
4,000----------	28	273	5.4	29	277	10.5	30	262	10.9	25	205	16.0	30	252	11.7
5,000----------	28	278	5.9	30	282	12.9	30	267	12.7	23	209	20.0	30	251	13.4
6,000----------	24	271	5.2	28	276	14.7	29	264	14.7	23	212	23.3	30	257	16.0
8,000----------	24	274	5.2	26	278	17.8	26	270	17.5	23	223	25.8	30	249	21.6
10,000---------	23	283	5.9	12	291	17.0	26	273	22.8	21	238	29.7	27	242	25.8
12,000---------	21	310	7.7				24	277	24.0	20	241	30.8	27	240	22.7
14,000---------	21	288	8.1				17	283	17.3	19	235	25.0	27	254	23.7
16,000---------	21	301	5.5							17	234	19.2	22	249	16.3
18,000---------	21	338	3.6							15	256	8.3	20	246	15.1
20,000---------	18	38	4.4							10	300	1.6	19	253	10.8
22,000---------	16	63	5.9										16	251	9.6
24,000---------													11	252	13.6

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following Table 22 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

RAWIN DATA

Average monthly resultant winds

Table 22 *Air Force Data for July 1954

Altitude (meters) m.s.l.	Denver, Colo. (1,661 m.)			Ft. Worth, Tex. (178 m.)			Ogden, Utah (1,450 m.)			Rantoul, Ill. (227 m.)			Rome, N. Y. (146 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface----------	31	183	2.2	31	152	2.0	31	122	1.8	31	34	0.8	31	325	0.5
500--------------	--	---	----	31	158	6.5	--	---	----	30	98	1.5	29	303	2.9
1,000------------	--	---	----	31	160	7.3	--	---	----	30	157	.7	29	296	6.2
1,500------------	--	---	----	31	165	5.5	31	128	1.9	30	264	2.6	28	299	7.8
2,000------------	30	202	3.9	31	170	4.1	29	167	2.5	30	278	4.7	28	298	9.3
2,500------------	30	201	2.6	31	160	2.9	30	205	3.0	30	297	6.5	29	296	10.5
3,000------------	30	183	1.0	31	138	.8	29	233	3.9	29	303	7.9	29	295	10.2
4,000------------	30	278	.4	31	74	3.2	28	259	5.2	29	307	10.0	30	294	12.9
5,000------------	30	269	1.4	30	69	4.5	28	253	8.4	30	313	11.1	31	293	14.4
6,000------------	31	271	4.2	30	66	5.1	29	247	9.4	30	311	11.8	31	295	15.9
8,000------------	26	271	6.0	30	76	3.3	29	242	13.0	30	308	16.2	31	291	20.6
10,000-----------	25	267	9.6	29	88	3.9	30	236	17.2	30	302	18.8	30	299	24.2
12,000-----------	25	272	10.7	28	107	3.5	30	232	19.5	28	299	18.8	29	295	28.4
14,000-----------	24	266	7.6	23	89	4.6	29	237	17.4	28	307	20.6	22	290	21.0
16,000-----------	16	273	5.6	11	29	1.4	23	249	9.5	21	318	13.8	19	296	14.6
18,000-----------	12	55	.4				18	206	.6	12	349	5.5	12	299	3.9
20,000-----------							14	93	5.2	10	32	4.4			
22,000-----------							12	93	7.6						

* August data for the above Air Force stations will be included in the December issue of this publication.

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following Table 22 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun.

NOVEMBER 1954

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
WASHINGTON, D. C. (WBCO)									
	Air mass								
	4.95	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.95
Nov.									
8	----	----	0.96	1.22	----	1.15	0.97	0.81	0.69
9	0.71	0.78	1.11	1.17	----	1.25	1.04	.97	.86
10	----	----	1.05	1.08	----	1.22	.92	----	----
13	.75	.89	1.02	----	----	1.11	.82	----	----
15	----	----	----	1.09	----	1.05	----	----	----
29	.82	----	1.10	----	----	----	----	----	----
30	.82	.91	1.03	----	----	----	----	----	----
Averages	.78	.84	1.04	1.14	----	1.16	.94	.89	.78
LINCOLN, NEBR.									
	Air mass								
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77
Nov.									
2	0.94	1.06	1.20	1.35	----	1.36	1.20	1.09	1.01
4	.92	1.02	1.15	1.31	----	1.31	1.16	1.03	.92
10	.62	.75	.92	1.14	----	1.17	.97	.84	.75
16	----	----	----	1.17	----	1.17	.97	.82	.71
18	----	----	----	----	----	----	1.09	.96	.83
24	.86	.99	1.14	----	----	----	1.14	.99	.90
29	.89	1.02	1.15	----	----	----	----	----	----
Averages	.85	.97	1.11	1.24	----	1.25	1.09	.96	.85
Departures	-.03	-.03	-.04	-.10	----	-.06	-.06	-.05	-.05
ALBUQUERQUE, N. MEX.									
	Air mass								
	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0
Nov.									
1	0.93	1.04	----	1.30	----	1.15	1.11	0.98	----
2	.73	.87	1.01	----	----	1.15	.87	----	0.57
3	.63	.78	----	.98	----	----	.98	.86	.73
4	.74	.87	1.03	1.18	----	1.25	1.12	1.01	.89
5	.89	.99	1.14	1.25	----	1.30	1.22	1.11	1.02
6	.95	1.06	1.19	1.32	----	1.35	1.25	1.13	1.04
7	.97	1.08	1.20	1.35	----	1.38	1.24	1.12	1.00
8	----	----	----	----	----	1.36	1.22	1.11	1.01
9	1.01	1.11	1.22	1.35	----	----	----	----	----
10	.92	1.03	1.13	----	----	1.30	----	----	----
11	----	----	----	----	----	1.32	1.17	1.05	.98
12	.96	1.07	1.18	1.32	----	1.33	1.18	1.05	.94
14	.78	.90	1.06	1.25	----	1.18	1.03	.93	.82
15	.87	.99	1.11	1.28	----	1.28	1.14	1.03	.92
16	.90	1.02	1.15	1.30	----	1.22	1.10	.93	----
17	----	----	1.20	----	----	1.26	1.13	1.03	.93
18	.98	1.07	1.19	1.34	----	1.26	1.18	1.06	.99
19	----	----	1.17	1.30	----	1.10	1.13	1.04	.97
20	----	1.11	1.20	1.33	----	1.29	1.04	1.07	.97
21	----	----	----	----	----	----	1.17	1.04	.94
22	.94	----	----	1.11	----	1.24	1.07	1.01	----
23	.98	1.09	1.14	1.29	----	----	----	----	----
25	----	----	----	1.35	----	1.28	1.21	1.12	1.02
26	1.02	1.10	1.22	1.33	----	----	----	----	----
27	.98	1.07	1.18	1.33	----	1.25	.82	.81	.57
28	----	1.14	1.24	1.38	----	1.37	1.22	1.11	.98
29	.85	.97	1.11	1.29	----	1.20	----	----	----
30	----	----	----	----	----	----	1.12	1.00	.89
Averages	.90	1.02	1.15	1.28	----	1.26	1.12	1.03	.91
Departures	-.09	-.08	-.07	-.09	----	-.10	-.09	-.07	-.08

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
BLUE HILL, MASS.									
	Air mass								
	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86
Nov.									
6	0.65	0.74	----	----	----	----	----	0.93	0.78
8**	.89	1.02	1.15	1.22	----	1.15	0.88	.70	.54
9	.95	1.07	1.19	1.33	----	1.37	1.24	1.10	1.00
10	1.00	1.13	1.21	1.24	----	1.33	1.18	1.07	.98
11	----	1.13	1.21	----	----	----	1.15	1.04	.94
13	1.05	1.15	1.26	1.36	----	1.35	----	----	----
15**	----	----	----	----	----	----	1.11	.98	.88
22	----	----	----	----	----	----	----	1.05	.95
23	.85	.96	----	----	----	----	----	----	----
28	.80	.97	1.08	----	----	----	1.05	----	----
30	.88	.97	----	----	----	----	----	----	----
Averages	.88	1.02	1.18	1.29	----	1.30	1.10	.98	.87
Departures	-.01	.03	.08	.02	----	.05	.00	.01	.02
TABLE MOUNTAIN, CALIF.									
	Air mass								
	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76
Nov.									
1	0.90	1.04	1.14	1.32	----	----	----	----	----
2	----	----	----	1.37	----	----	----	----	----
3	----	----	----	1.42	----	----	----	----	----
5	----	----	----	1.46	----	----	----	----	----
6	1.18	1.26	1.36	1.47	----	----	----	----	----
14	1.14	1.22	1.38	----	----	----	----	----	----
16	----	----	----	1.54	----	----	----	----	----
17	1.16	1.25	1.35	1.47	----	----	----	----	----
18	1.17	1.25	1.36	1.50	----	----	----	----	----
19	1.20	1.27	1.39	1.51	----	----	----	----	----
20	----	----	----	1.50	----	----	----	----	----
23	1.16	1.23	1.34	1.48	----	----	----	----	----
24	----	----	----	1.50	----	----	----	----	----
25	----	----	----	1.43	----	----	----	----	----
Averages	1.13	1.22	1.33	1.46	----	----	----	----	----
Departures	-.04	-.04	-.03	-.06	----	----	----	----	----
MADISON, WIS.									
	Air mass								
	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0
Nov.									
3	0.78	0.90	1.05	1.29	----	----	----	----	----
5	.95	1.06	1.22	----	----	----	----	----	----
6	.90	1.00	1.12	1.29	----	1.28	1.06	----	----
7	.69	.81	.92	1.06	----	1.05	.87	0.69	0.54
8	.97	1.05	1.16	1.30	----	1.29	1.12	----	----
10	.70	.80	.95	----	----	----	.86	.67	.60
12	1.02	1.10	----	----	----	----	----	----	----
14	.99	1.10	1.21	----	----	----	1.20	1.08	.97
15	.86	1.00	----	----	----	----	1.00	.84	.66
16#	----	.52	.78	----	----	----	----	.73	.62
17	.60	.70	.84	----	----	----	.88	.72	.65
Averages	.85	.91	1.03	1.23	----	1.21	1.00	.79	.67
Departures	.01	-.05	-.08	-.06	----	-.09	----	----	----

* Extrapolated
** Smoke
# Haze

Langley is the unit used to denote one gram calorie per square centimeter.

An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

SOLAR RADIATION DATA

Table 31a Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date------------	5	6	7	8	9	10	11		12	13	14	15	16	17	18		19	20	21	22	23	24	25	
Langleys--------	42	60	59	53	59	53	59	54	51	58	57	58	58	52	25	51	36	18	31	51	46	26	17	32
Date------------	26	27	28	29	30	1	2																	
Langleys--------	58	55	51	28	46	34	54	47																

Table 31b Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date------------	5	6	7	8	9	10	11		12	13	14	15	16	17	18		19	20	21	22	23	24	25	
Langleys--------	39	221	186	216	205	208	218	184	133	210	125	94	114	64	25	108	42	27	34	193	169	32	18	73
Date------------	26	27	28	29	30	1	2																	
Langleys--------	149	170	165	27	131	36	83	109																

Table 31c Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date------------	5	6	7	8	9	10	11		12	13	14	15	16	17	18		19	20	21	22	23	24	25	
Langleys--------	76	529	396	502	536	546	558	449	197	499	387	411	275	135	19	275	41	22	53	504	370	34	14	148
Date------------	26	27	28	29	30	1	2																	
Langleys--------	368	449	467	36	177	32	209	249																

Table 31d Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date------------	5	6	7	8	9	10	11		12	13	14	15	16	17	18		19	20	21	22	23	24	25	
Langleys--------	81	208	167	184	254	233	225	193	106	182	160	206	110	77	25	124	46	32	43	205	77	27	18	64
Date------------	26	27	28	29	30	1	2																	
Langleys--------	134	174	148	27	57	40	121	100																

Table 31e Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date------------	5	6	7	8	9	10	11		12	13	14	15	16	17	18		19	20	21	22	23	24	25	
Langleys--------	72	62	147	47	40	43	32	63	78	43	70	61	85	99	24	66	50	33	49	50	79	38	16	45
Date------------	26	27	28	29	30	1	2																	
Langleys--------	81	63	41	39	74	45	104	. 64																

Note: Langley is the unit used to denote one gram calorie per square centimeter.

SOLAR RADIATION DATA

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.

1954	Aklavik, MacKenzie	Albuquerque, N.Mex.	Annette, Alaska	Astoria, Oreg.	Atlanta, Ga.	Barrow, Alaska	Bethel, Alaska	Bismark, N. Dak.	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Tex.	Canton Island, Pacific Area	Caribou, Me.	Charleston, S. C.	Columbia, Mo.	Columbus, Ohio	Dodge City, Kans.	E. Lansing, Mich.
Nov. 5-----	---	429	34	31	334	6	43	214	77	270	74	367	649	53	86	367	57	441	158
Nov. 6-----	7	431	120	202	326	9	44	228	262	280	214	463	681	153	388	303	75	438	131
Nov. 7-----	16	428	67	41	374	13	52	252	203	249	195	300	615	235	412	324	71	417	257
Nov. 8-----	7	417	29	16	368	4	58	220	243	218	211	245	645	99	432	316	66	363	275
Nov. 9-----	17	420	84	143	349	20	40	223	254	88	221	218	621	178	402	172	73	129	274
Nov. 10-----	27	413	23	194	280	19	26	145	253	231	204	232	659	247	356	285	72	344	280
Nov. 11-----	17	383	60	17	283	10	70	237	250	80	232	---	648	83	362	283	68	343	190
Averages------	17	417	60	92	331	11	48	217	220	202	193	304	(645)	150	348	293	69	354	224
Departures----	---	---	---	---	---	---	---	---	40	---	---	---	---	---	---	---	---	---	100
Nov. 12-----	12	400	44	133	352	14	71	204	121	36	101	195	549	207	245	279	75	341	261
Nov. 13-----	14	136	18	18	342	12	54	93	234	193	192	272	---	229	(365)	287	63	300	240
Nov. 14-----	3	382	11	29	301	3	64	177	198	86	170	249	658	56	99	275	56	251	180
Nov. 15-----	4	390	43	78	62	2	26	(206)	213	33	169	433	571	228	(103)	277	67	336	266
Nov. 16-----	6	378	37	56	34	1	28	(86)	155	---	122	424	573	54	(215)	271	28	345	182
Nov. 17-----	2	372	21	40	66	1	48	193	123	---	89	407	---	105	185	283	57	310	219
Nov. 18-----	6	387	55	12	93	0	21	(85)	30	---	36	365	---	23	232	23	56	347	54
Averages------	7	349	33	52	178	5	45	(149)	153	87	126	335	588	129	(206)	242	57	319	200
Departures----	---	---	---	---	---	---	---	---	-10	---	---	---	---	---	---	---	---	---	82
Nov. 19-----	7	372	27	179	148	---	54	194	48	---	40	443	(681)	21	258	170	35	331	27
Nov. 20-----	4	371	1	75	84	---	41	58	34	---	44	431	612	21	320	287	8	322	129
Nov. 21-----	2	329	17	135	345	---	25	199	57	---	70	423	662	21	368	150	16	250	43
Nov. 22-----	0	356	103	87	153	---	29	133	216	---	188	422	656	59	361	276	15	333	56
Nov. 23-----	0	345	1	169	330	---	34	158	168	---	158	432	670	31	172	106	35	312	119
Nov. 24-----	0	351	1	107	312	---	25	194	45	---	44	415	---	(49)	317	82	20	324	38
Nov. 25-----	0	359	24	131	330	---	32	152	22	---	21	313	669	36	361	159	11	181	71
Averages------	2	355	25	126	243	---	34	155	84	---	81	411	(658)	(34)	308	176	20	293	64
Departures----	---	---	---	---	---	---	---	---	-56	---	---	---	---	---	---	---	---	---	-22
Nov. 26-----	0	354	49	18	426	---	22	113	174	---	135	386	---	44	(321)	206	14	281	110
Nov. 27-----	4	351	35	67	69	---	13	---	193	---	148	381	374	80	(329)	244	7	191	38
Nov. 28-----	0	366	78	99	89	---	39	111	198	---	188	403	644	33	238	211	20	325	75
Nov. 29-----	0	340	23	163	345	---	13	105	42	---	37	103	655	41	362	278	20	130	51
Nov. 30-----	0	300	51	185	322	---	6	60	105	---	---	246	620	91	(362)	44	50	294	65
Dec. 1-----	1	167	44	64	124	---	26	(138)	52	---	---	287	---	99	254	128	21	215	88
Dec. 2-----	0	214	0	196	321	---	11	189	140	62	---	256	---	86	(309)	154	25	232	104
Averages------	1	297	40	113	242	---	19	(120)	129	---	127	295	573	68	(311)	181	22	238	76
Departures----	---	---	---	---	---	---	---	---	-18	---	---	---	---	---	---	---	---	---	-14
Accumulated Departures January 1 to December 2, 1954	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	-1092

1954	East Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Ely, Nev.	Fairbanks, Alaska	Fort Worth, Tex.	Fresno, Calif.	Grand Junction, Colo.	Great Falls, Mont.	Greensboro, N. C.	Griffin, Ga.	Hatteras, N. C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.	Lake Charles, La.	Lander, Wyo.	Las Vegas, Nev.
Nov. 5-----	73	83	460	359	24	506	337	335	16	267	360	79	307	417	136	446	276	364
Nov. 6-----	279	96	434	355	14	480	333	350	242	312	383	160	268	423	270	437	326	394
Nov. 7-----	116	172	433	333	18	496	338	349	232	345	275	381	282	393	296	435	318	319
Nov. 8-----	258	160	424	322	49	(324)	80	344	247	327	267	406	260	325	193	---	314	376
Nov. 9-----	280	---	436	319	80	(166)	343	344	199	315	380	382	232	395	152	---	294	374
Nov. 10-----	283	147	419	249	40	(446)	106	344	232	310	309	378	279	137	304	273	294	244
Nov. 11-----	261	126	371	123	31	433	204	227	136	337	279	340	267	---	284	363	163	97
Averages------	221	127	425	294	36	(407)	249	328	195	316	322	304	271	348	234	391	283	347
Departures----	42	---	---	---	1	---	---	---	---	---	---	---	---	---	92	---	---	---
Nov. 12-----	184	32	425	181	36	422	343	46	105	283	380	396	269	394	80	390	262	293
Nov. 13-----	260	94	398	319	26	427	293	117	181	256	371	327	254	396	271	314	145	365
Nov. 14-----	---	45	387	280	30	138	222	311	132	251	301	243	218	383	73	175	303	355
Nov. 15-----	272	127	406	284	29	(278)	(33)	313	136	210	55	177	250	267	269	69	268	346
Nov. 16-----	168	28	409	215	28	442	(299)	157	175	93	36	104	241	389	243	137	147	358
Nov. 17-----	96	97	421	313	12	443	276	322	194	66	61	315	235	375	105	---	264	351
Nov. 18-----	119	86	412	322	12	375	290	291	79	64	162	341	37	378	195	262	206	345
Averages------	183	73	408	274	25	(361)	(251)	223	143	175	195	272	215	369	177	225	228	345
Departures----	10	---	---	---	-2	---	---	---	---	---	---	---	---	---	49	---	---	---
Nov. 19-----	67	44	410	310	12	456	100	287	185	153	195	147	---	379	26	410	248	350
Nov. 20-----	46	108	410	273	13	448	(104)	294	115	94	83	96	29	369	48	401	222	342
Nov. 21-----	74	68	392	292	11	392	(94)	283	172	300	372	306	46	352	7	379	257	319
Nov. 22-----	240	47	389	289	14	(426)	100	291	118	275	214	339	95	357	77	338	250	332
Nov. 23-----	---	122	396	287	21	(430)	103	256	176	---	256	78	72	354	135	390	257	326
Nov. 24-----	74	75	380	259	9	(436)	(72)	247	148	---	302	215	--	341	56	381	159	328
Nov. 25-----	150	18	370	287	9	394	---	280	143	---	337	348	33	349	83	392	212	320
Averages------	108	69	393	290	13	(426)	(95)	277	151	206	266	218	55	357	62	385	229	331
Departures----	-31	---	---	---	-3	---	---	---	---	---	---	---	---	---	-46	---	---	---
Nov. 26-----	---	115	358	262	17	416	(64)	271	158	117	324	320	38	340	168	358	246	315
Nov. 27-----	---	46	372	245	---	416	244	212	39	101	82	348	105	347	169	339	165	321
Nov. 28-----	214	63	378	223	7	413	270	282	159	41	135	55	79	238	135	311	206	315
Nov. 29-----	158	37	375	156	14	419	301	82	108	239	383	322	120	347	19	384	237	199
Nov. 30-----	118	39	372	306	6	64	269	244	182	217	339	335	176	244	78	258	186	310
Dec. 1-----	99	130	344	263	7	169	282	260	190	110	170	236	75	334	30	270	271	279
Dec. 2-----	166	42	292	271	8	387	143	265	176	219	339	243	145	324	82	114	241	286
Averages------	151	67	356	247	10	326	(225)	231	145	149	253	265	106	311	97	291	222	289
Departures----	8	---	---	---	-1	---	---	---	---	---	---	---	---	---	2	---	---	---
Accumulated Departures January 1 to December 2, 1954	---	---	---	---	---	---	---	---	---	---	---	---	---	---	-3780	---	---	---

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.-Continued

	Lincoln, Nebr.	Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBCO)	Madison, Wisc.	Matanuska, Alaska	Medford, Oreg.	Miami, Fla.	Midland, Tex.	Nashville, Tenn.	Newport, R. I.	New York, N. Y.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Ottawa, Ontario	Phoenix, Ariz.	Prosser 4 NE, Wash.	Rapid City, S. Dak.	Riverside, Calif.	St. Cloud, Minn	San Antonio, Tex.	Santa Maria, Calif.	S. Ste. Marie, Mich.	Sayville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle, Wash. (WBAS)	Spokane, Wash.	State College, Pa.	Stillwater, Okla.	Swan Island, W. I.	Tampa, Fla.	Toronto, Ontario	Upton, N. Y.	Wake Island, Pacific Area	Washington, D. C. (Silver Hill Obs.)	Winnipeg, Manitoba
1954																																					
Nov. 5-----	255	355	376	360	204	15	247	469	427	323	70	119	---	433	149	(432)	88	153	402	154	489	388	108	115	100	110	46	206	121	357	515	171	147	107	532	214	198
Nov. 6-----	282	244	365	(355)	243	25	123	386	419	309	318	317	276	411	97	437	88	289	410	222	489	376	100	332	265	330	169	130	216	341	442	465	53	307	508	156	176
Nov. 7-----	292	345	305	(329)	220	54	207	404	352	358	258	292	357	409	180	373	123	253	378	236	464	333	137	282	246	316	83	273	273	---	483	455	149	285	433	362	72
Nov. 8-----	231	329	222	260	234	56	85	397	392	348	289	255	339	268	157	423	64	267	360	243	---	87	235	279	167	294	40	166	232	280	520	383	257	289	80	347	214
Nov. 9-----	255	312	333	340	177	56	66	276	266	232	308	316	318	229	153	414	64	279	388	175	---	366	91	333	216	315	161	110	289	280	345	310	179	254	489	313	(254)
Nov. 10-----	268	289	56	57	205	33	187	294	370	331	308	291	---	401	135	324	231	261	86	184	298	72	197	337	247	311	173	259	283	311	107	385	201	309	485	342	(316)
Nov. 11-----	246	285	167	144	167	40	62	336	381	311	288	299	298	379	145	391	95	215	159	240	---	224	125	317	240	310	91	137	255	311	158	236	234	291	516	338	(220)
Averages------	261	323	261	(265)	207	40	140	366	373	316	263	270	318	361	131	(399)	108	245	312	208	435	264	142	285	211	284	109	183	238	313	367	344	174	263	435	296	(207)
Departures----	37	---	---	---	---	---	---	---	---	84	62	86	---	---	---	---	---	---	9	---	---	---	---	---	---	---	---	---	68	---	---	---	---	---	---	---	---
Nov. 12-----	238	309	342	268	210	28	259	161	385	300	226	249	311	385	91	333	216	259	341	184	410	385	190	210	210	233	117	132	213	312	208	238	222	225	491	253	265
Nov. 13-----	196	309	335	327	182	26	86	270	383	322	304	257	311	377	46	400	75	225	389	96	400	(380)	128	317	225	303	26	187	271	299	410	320	255	296	502	322	(246)
Nov. 14-----	276	288	318	331	225	---	135	292	249	304	236	232	324	285	42	395	55	236	373	225	---	262	92	268	125	264	34	127	182	231	(417)	282	175	246	494	306	120
Nov. 15-----	250	186	197	197	216	---	181	314	359	165	277	269	177	359	82	385	81	197	302	201	429	63	126	307	236	302	34	117	257	286	505	318	(197)	---	(500)	303	310
Nov. 16-----	252	301	364	329	166	28	166	397	385	122	215	99	82	377	59	362	171	63	321	145	---	357	---	168	210	71	77	168	181	320	313	306	137	170	435	46	(181)
Nov. 17-----	225	289	361	342	172	49	168	360	377	270	66	73	218	364	47	390	53	227	381	155	---	348	---	109	84	118	45	125	33	302	295	352	137	133	442	101	(47)
Nov. 18-----	250	125	358	344	26	43	165	404	378	176	163	50	134	373	35	391	43	216	379	94	---	355	26	110	94	99	22	10	28	297	474	408	98	96	422	40	42
Averages------	241	258	325	306	171	35	166	314	359	237	213	176	223	360	58	379	99	203	355	157	---	(307)	112	213	169	199	51	124	166	292	(374)	318	(174)	194	(470)	196	(173)
Departures----	32	---	---	---	-	---	---	---	---	12	28	24	---	---	---	---	---	---	75	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---
Nov. 19-----	257	36	354	337	71	32	231	436	435	195	74	45	143	397	(42)	378	196	209	379	44	---	---	48	74	72	79	153	233	21	309	507	381	54	84	487	97	58
Nov. 20-----	117	321	353	339	42	20	226	412	360	115	76	66	52	374	(32)	382	97	183	374	124	---	342	76	67	65	55	67	206	62	302	263	335	20	79	490	38	137
Nov. 21-----	124	299	---	332	68	29	222	447	275	169	106	46	147	287	17	365	199	236	359	101	---	319	55	67	31	54	134	238	42	142	410	416	91	---	488	---	41
Nov. 22-----	232	104	306	298	39	16	192	360	349	198	255	85	260	377	76	358	193	207	354	203	---	326	117	196	73	---	88	227	64	294	490	380	59	---	500	227	70
Nov. 23-----	214	291	321	303	0	33	147	331	353	248	183	161	131	362	(89)	368	171	235	348	82	---	329	59	159	73	89	89	172	117	286	280	330	143	---	498	64	68
Nov. 24-----	244	304	250	279	23	6	65	423	349	151	93	9	163	393	(108)	360	27	233	341	92	---	325	34	16	59	51	147	125	16	302	440	347	10	43	498	41	64
Nov. 25-----	237	282	63	251	84	23	127	415	346	123	77	146	56	139	70	325	163	127	331	67	---	337	152	140	64	162	139	167	92	87	136	382	31	130	453	137	57
Averages------	203	234	275	306	47	23	173	403	352	171	123	80	136	333	(62)	362	149	204	355	102	---	330	77	103	63	82	117	195	59	246	361	367	58	84	488	101	71
Departures----	10	---	---	---	---	---	---	---	---	-14	-28	-57	---	---	---	---	---	---	74	---	---	---	---	---	---	---	---	---	-59	---	---	---	---	---	---	---	---
Nov. 26-----	162	272	---	222	14	7	89	423	348	293	153	211	271	355	84	351	95	208	326	46	---	305	40	170	71	159	46	173	54	279	---	400	66	176	455	98	37
Nov. 27-----	149	188	54	(146)	121	7	79	419	338	275	214	168	57	333	(92)	348	214	162	335	139	---	321	35	257	92	217	136	239	99	227	489	401	39	214	452	203	66
Nov. 28-----	191	165	---	(104)	24	8	150	421	340	27	227	154	26	436	96	356	191	101	318	89	---	316	53	181	133	153	67	148	116	300	341	396	143	199	350	126	76
Nov. 29-----	213	280	226	229	26	32	---	359	286	289	130	153	314	282	41	342	159	192	169	144	---	(323)	101	115	44	218	45	136	51	300	443	244	64	114	390	241	100
Nov. 30-----	83	160	292	269	38	10	203	302	346	243	174	179	221	112	(55)	288	169	129	337	64	---	---	19	168	116	184	130	163	60	82	455	380	42	177	464	314	93
Dec. 1-----	49	119	261	269	166	12	73	302	276	133	132	95	144	341	(80)	208	121	215	302	193	---	331	81	187	127	82	112	229	36	251	397	347	40	174	341	119	96
Dec. 2-----	223	195	247	230	171	7	134	395	297	189	168	198	222	307	(122)	161	61	224	158	72	---	225	99	243	91	188	142	150	43	234	315	272	126	(199)	337	93	111
Averages------	153	197	216	(210)	80	12	121	375	319	207	171	166	179	309	(82)	294	144	176	278	107	---	(303)	61	189	96	172	97	177	66	239	407	349	74	(179)	(398)	170	83
Departures----	-26	---	---	---	---	---	---	---	---	37	15	35	---	---	---	---	---	---	20	---	---	---	---	---	---	---	---	---	-62	---	---	---	---	---	---	---	---

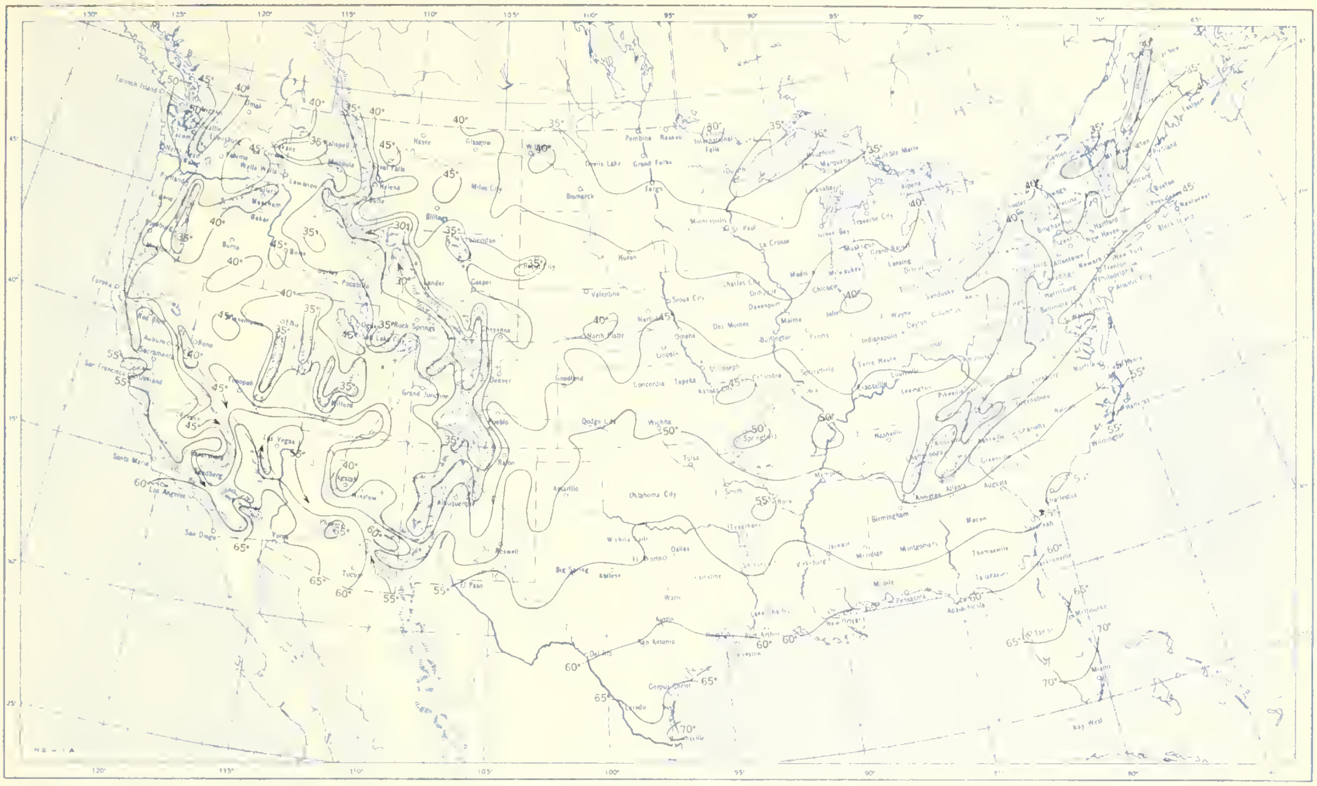
Accumulated Departures January 1 to December 2, 1954

	Lincoln, Nebr.	Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBCO)	Madison, Wisc.	Matanuska, Alaska	Medford, Oreg.	Miami, Fla.	Midland, Tex.	Nashville, Tenn.	Newport, R. I.	New York, N. Y.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Ottawa, Ontario	Phoenix, Ariz.	Prosser 4 NE, Wash.	Rapid City, S. Dak.	Riverside, Calif.	St. Cloud, Minn	San Antonio, Tex.	Santa Maria, Calif.	S. Ste. Marie, Mich.	Sayville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle, Wash. (WBAS)	Spokane, Wash.	State College, Pa.	Stillwater, Okla.	Swan Island, W. I.	Tampa, Fla.	Toronto, Ontario	Upton, N. Y.	Wake Island, Pacific Area	Washington, D. C. (Silver Hill Obs.)	Winnipeg, Manitoba
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	18249	---	---	---	---	---	---	---	---	---	-301	---	---	---	---	---	---	---	---

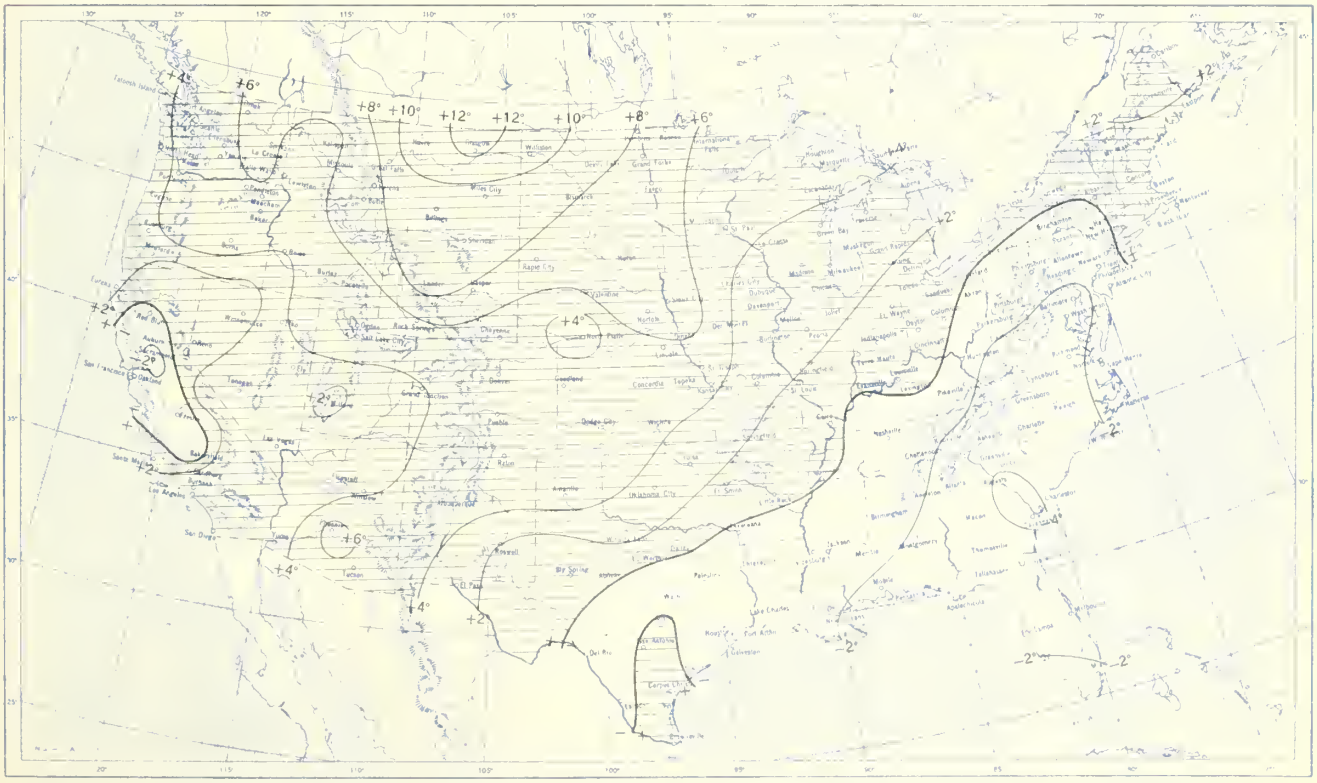
Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

NWRC, Asheville, N. C., --- 2/1/55 --- 1800

Chart I. A. Average Temperature (°F.) at Surface, November 1954.

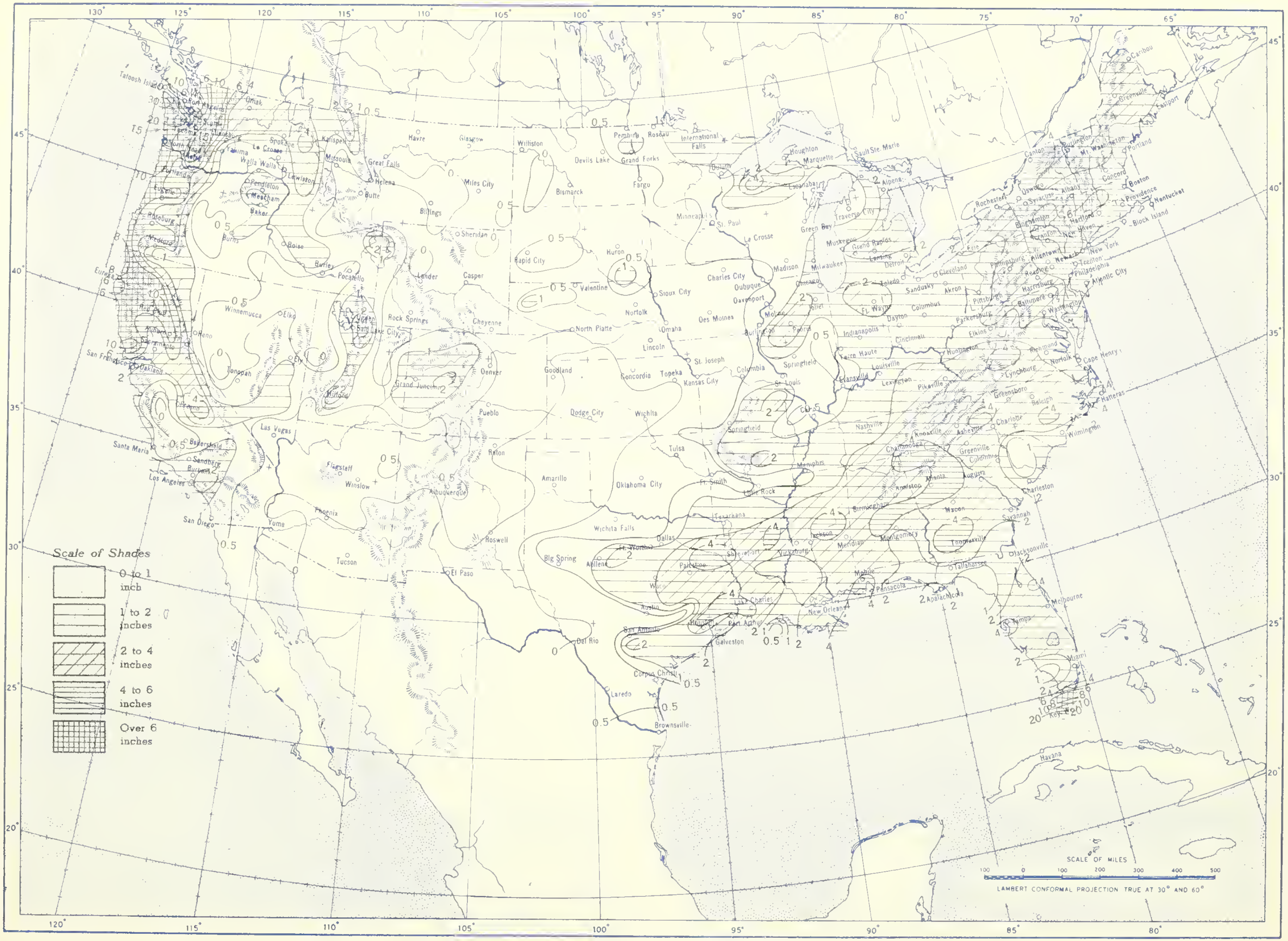


B. Departure of Average Temperature from Normal (°F.), November 1954.



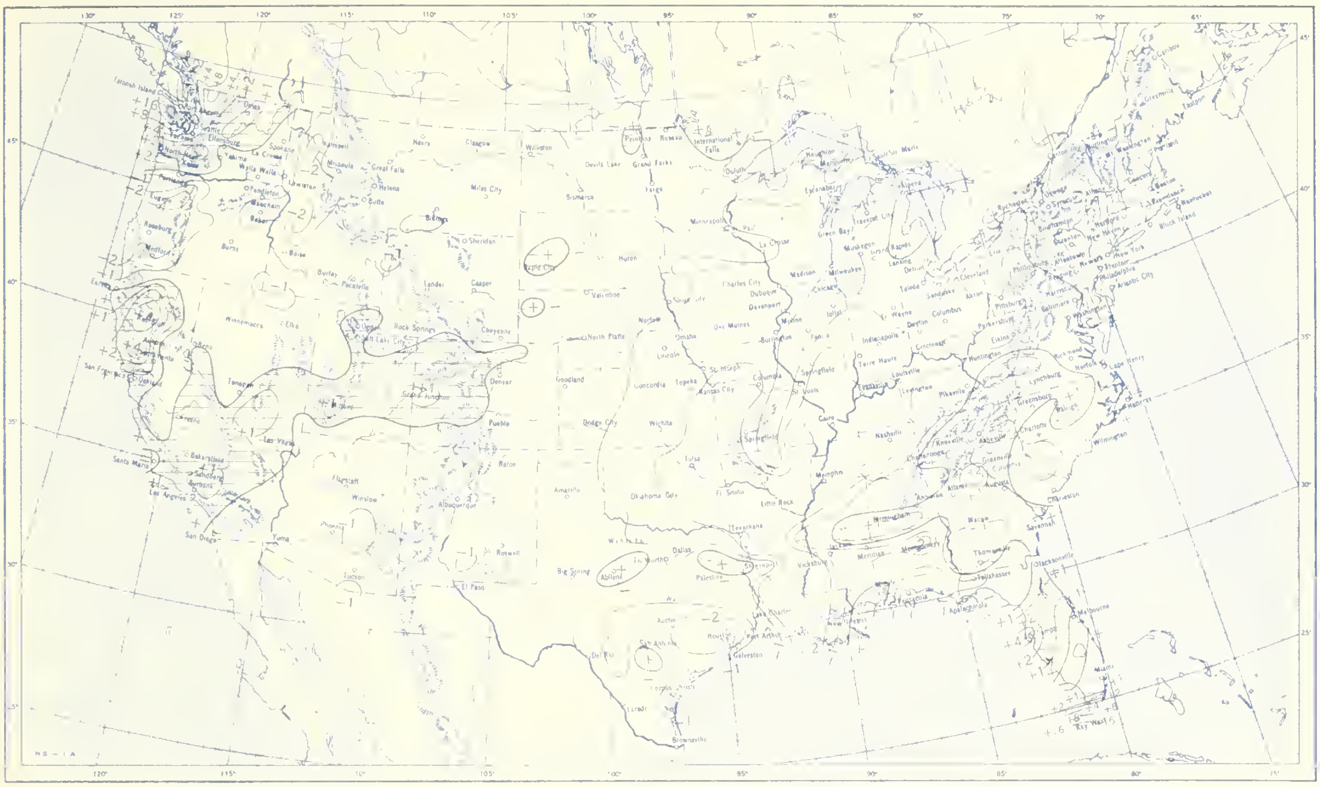
A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.
B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), November 1954.

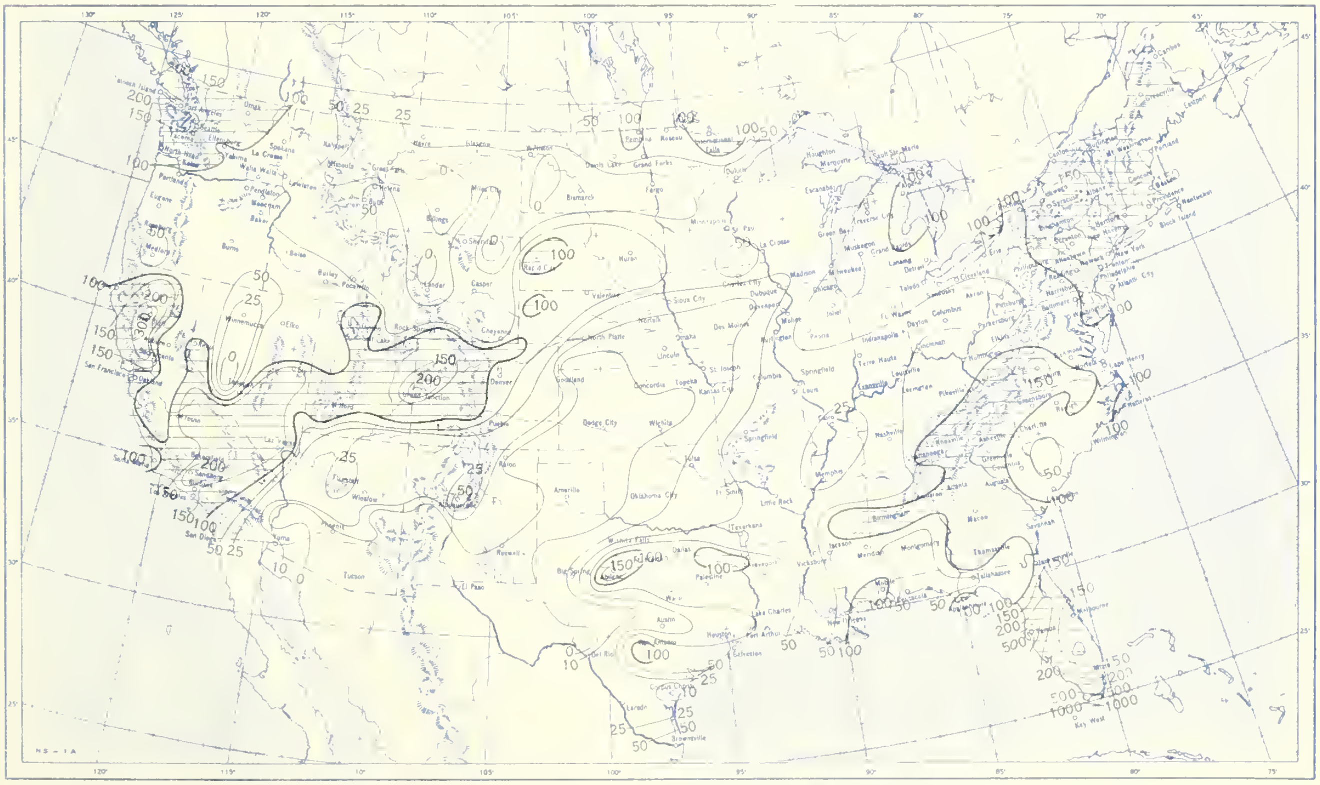


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), November 1954

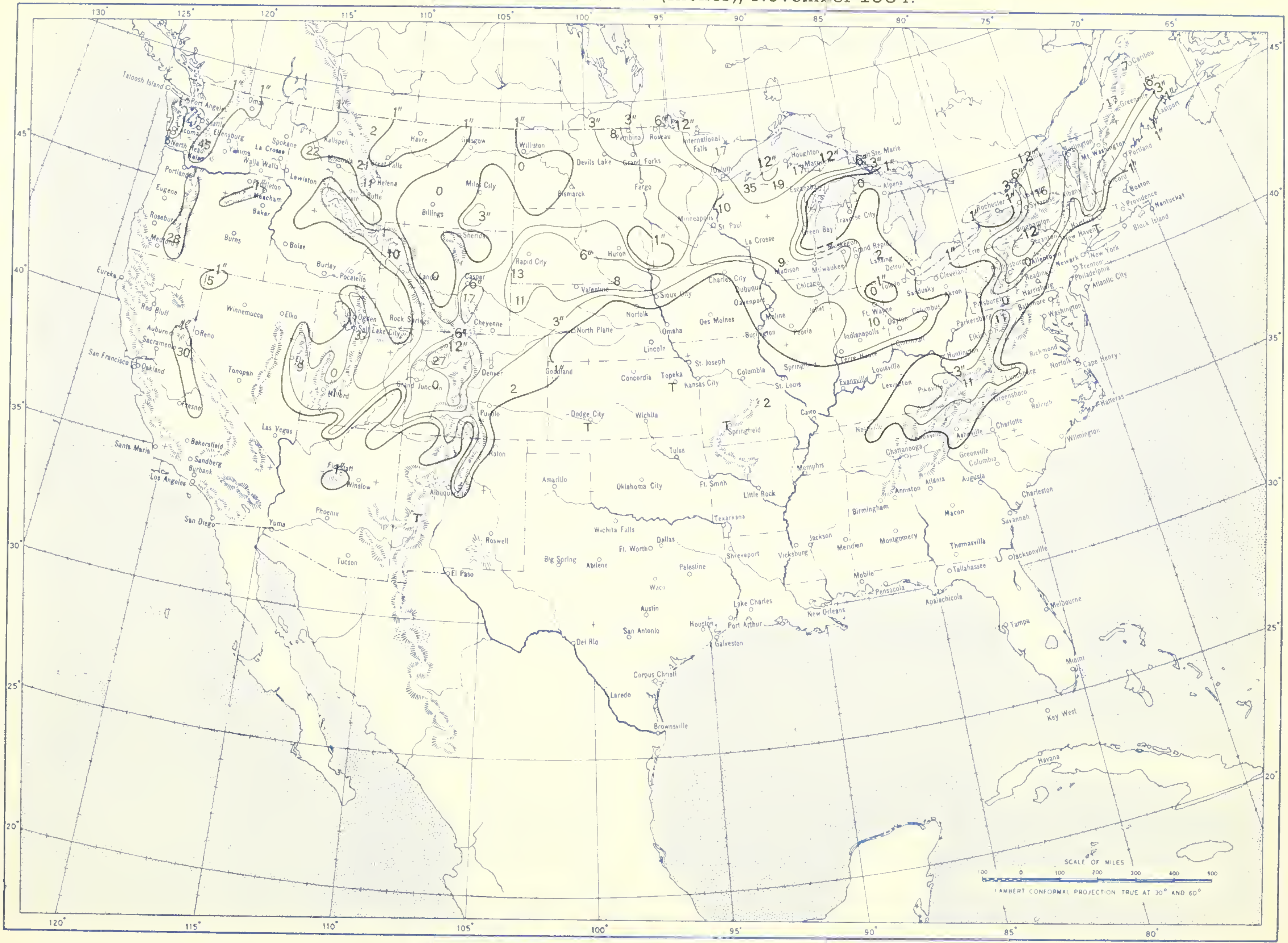


B. Percentage of Normal Precipitation, November 1954.



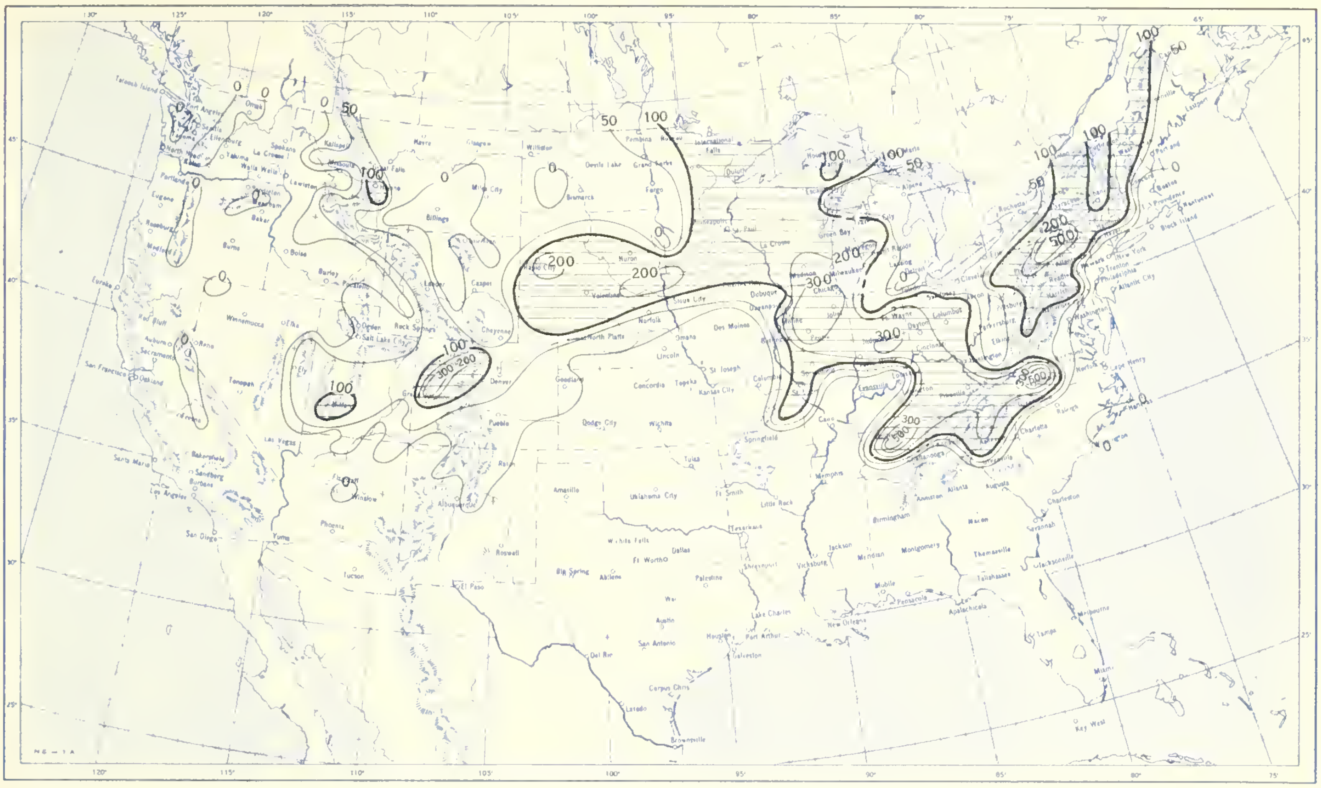
Normal monthly precipitation amounts are computed for station having at least 10 years of record.

Chart IV. Total Snowfall (Inches), November 1954.



This is the total of unmelted snowfall recorded during the month at Weather Bureau and cooperative stations. This chart and Chart V are published only for the months of November through April although of course there is some snow at higher elevations, particularly in the far West, earlier and later in the year.

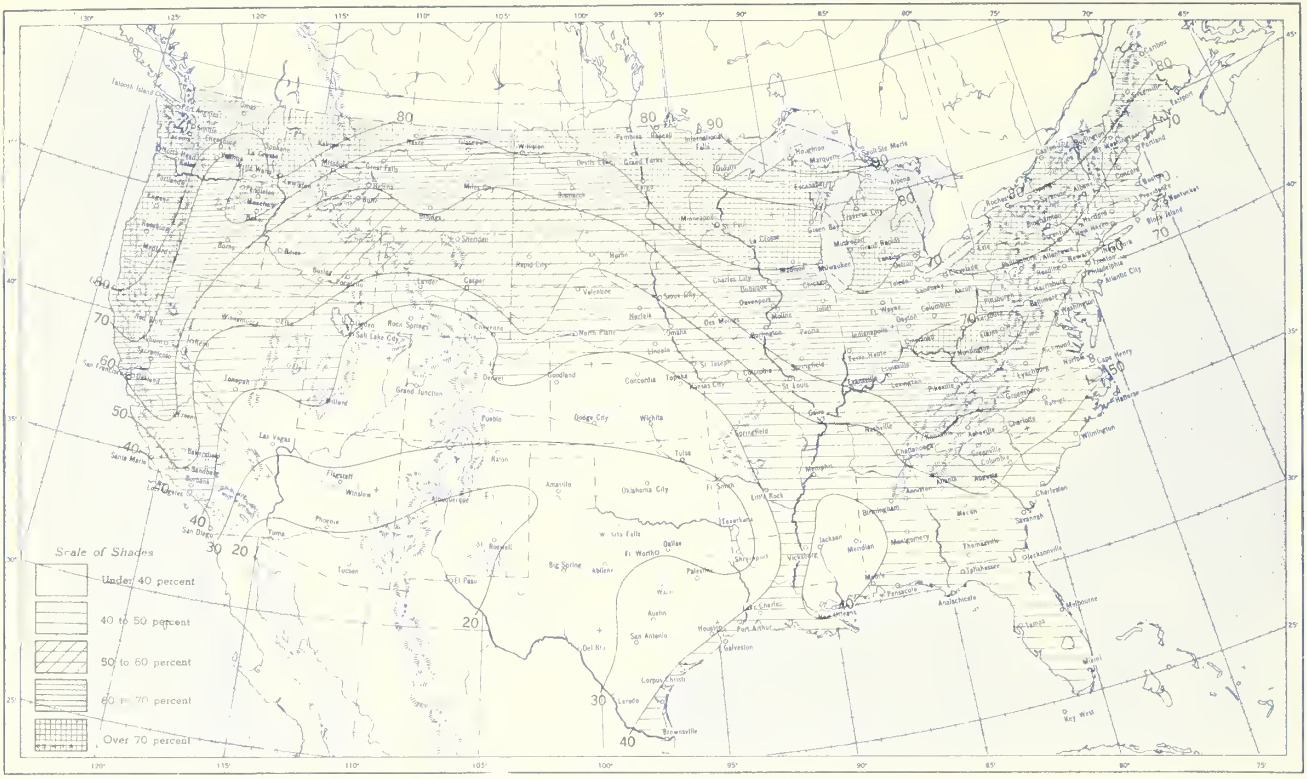
Chart V. A. Percentage of Normal Snowfall, November 1954.



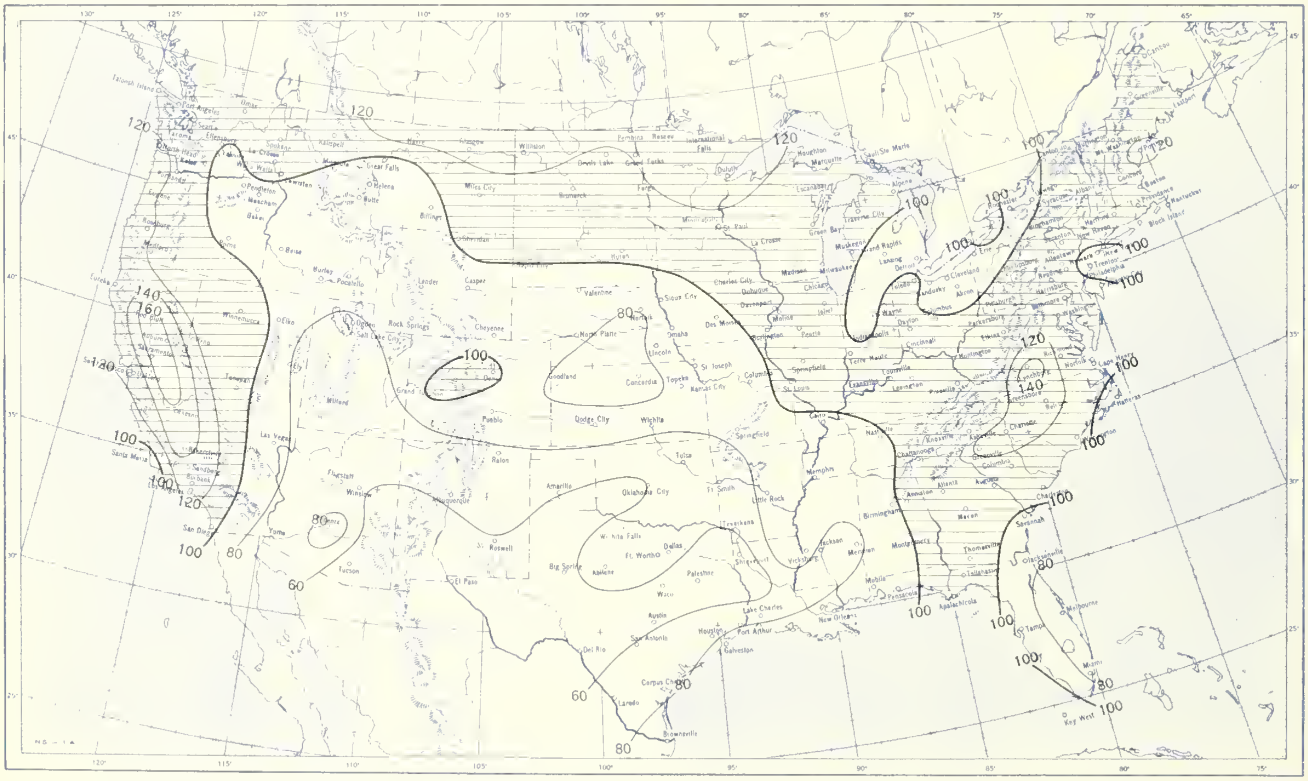
B. Depth of Snow on Ground (Inches).

A. Amount of normal monthly snowfall is computed for Weather Bureau stations having at least 10 years of record.
B. Shows depth currently on ground at 7:30 a. m. E.S.T., of the Tuesday nearest the end of the month. It is based on reports from Weather Bureau and cooperative stations. Dashed line shows greatest southern extent of snowcover during month.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, November 1954.

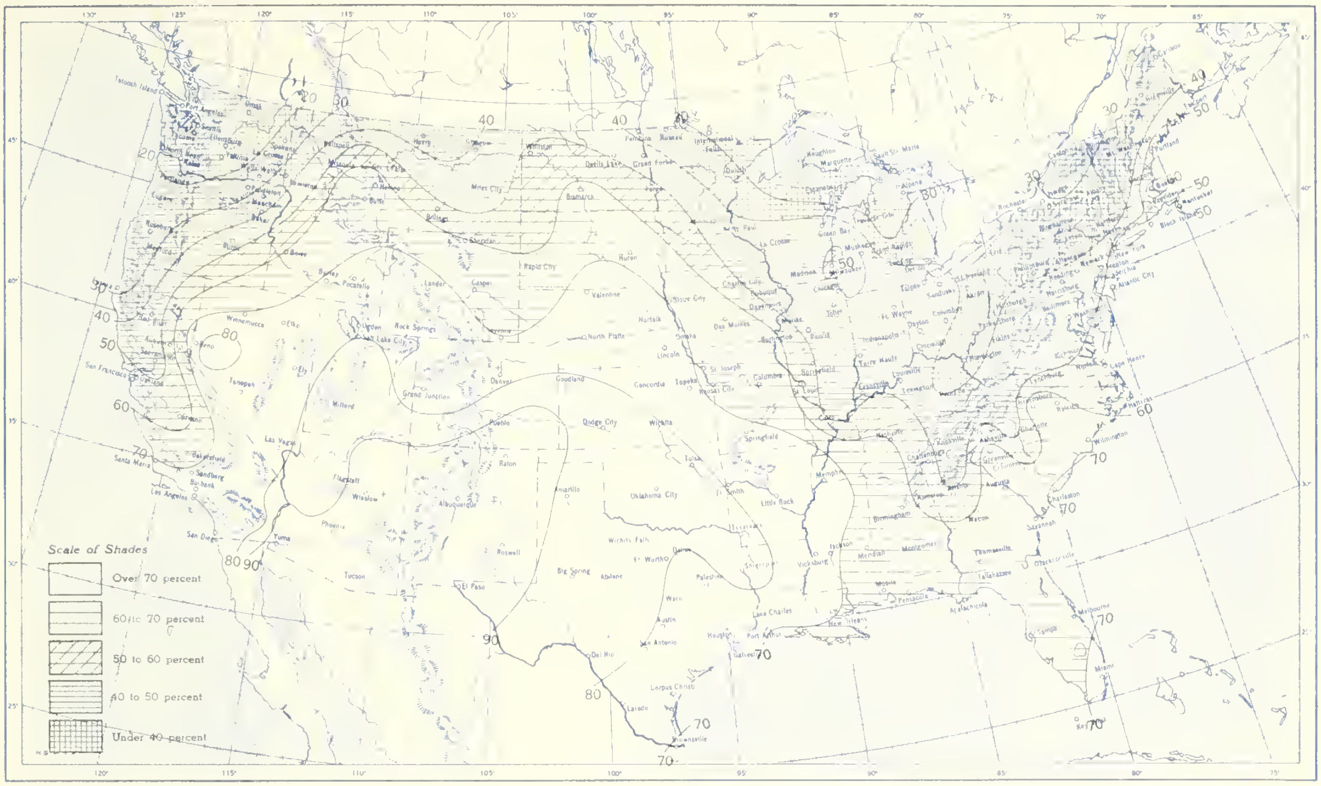


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, November 1954.

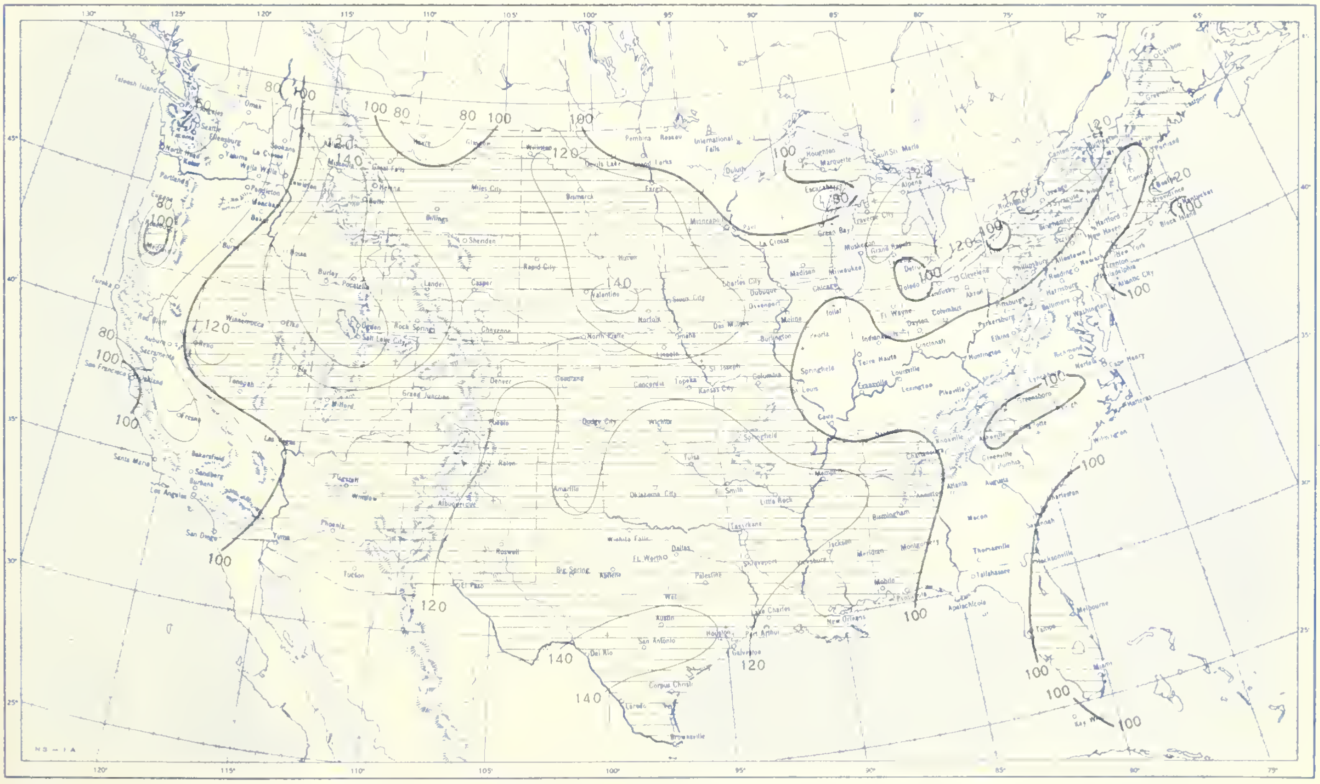


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, November 1954.



B. Percentage of Normal Sunshine, November 1954.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, November 1954. Inset: Percentage of Normal

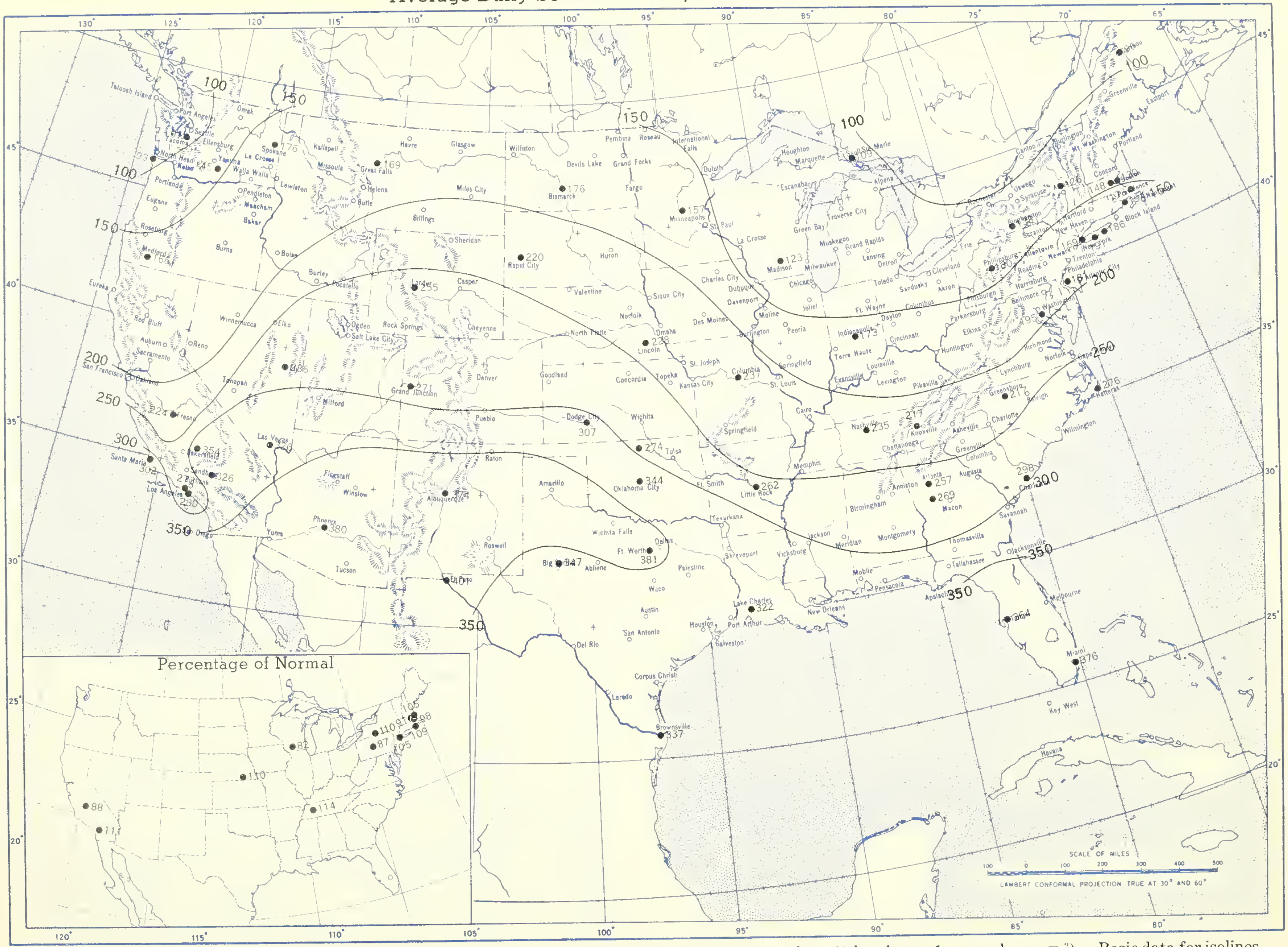
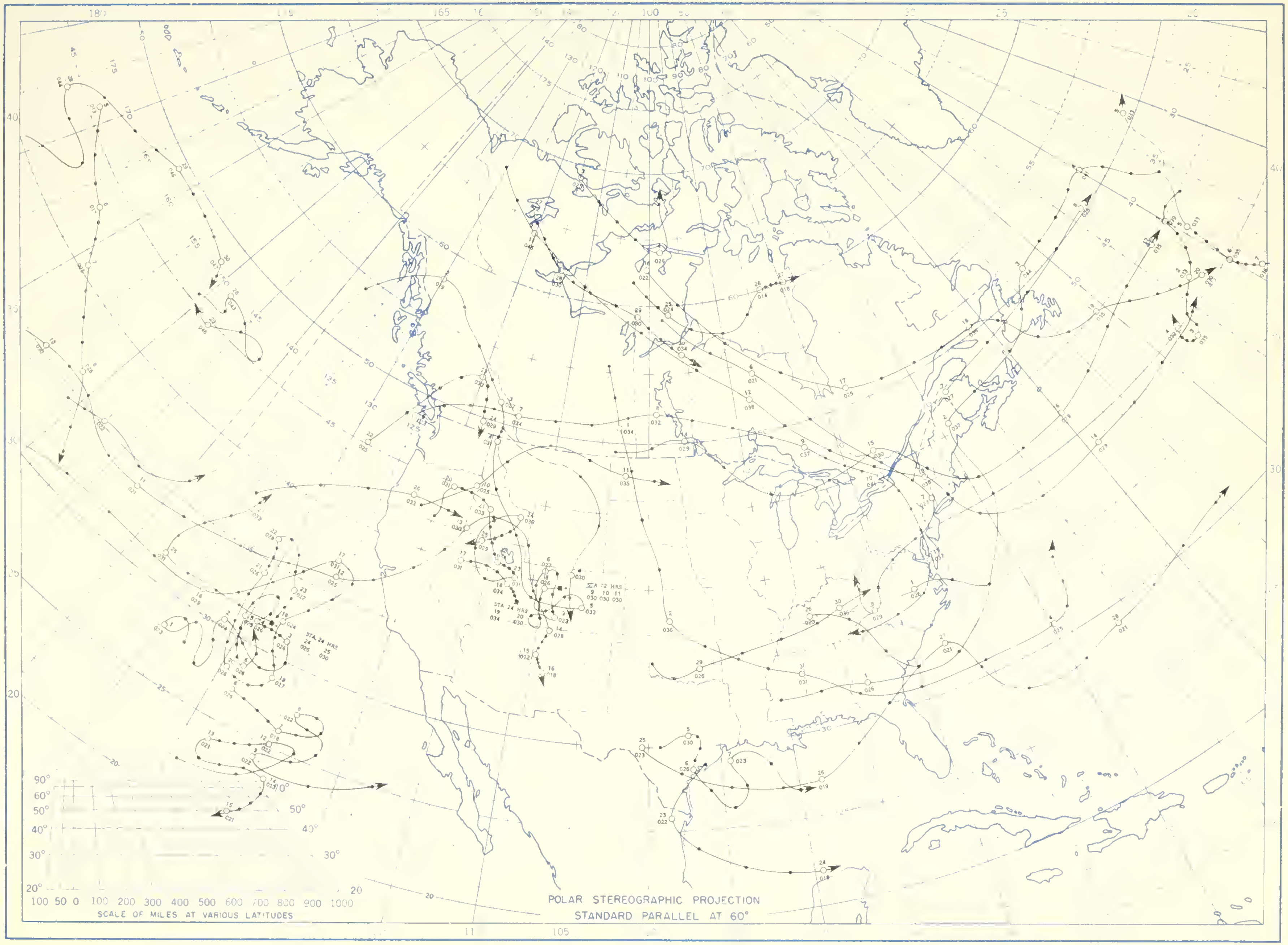


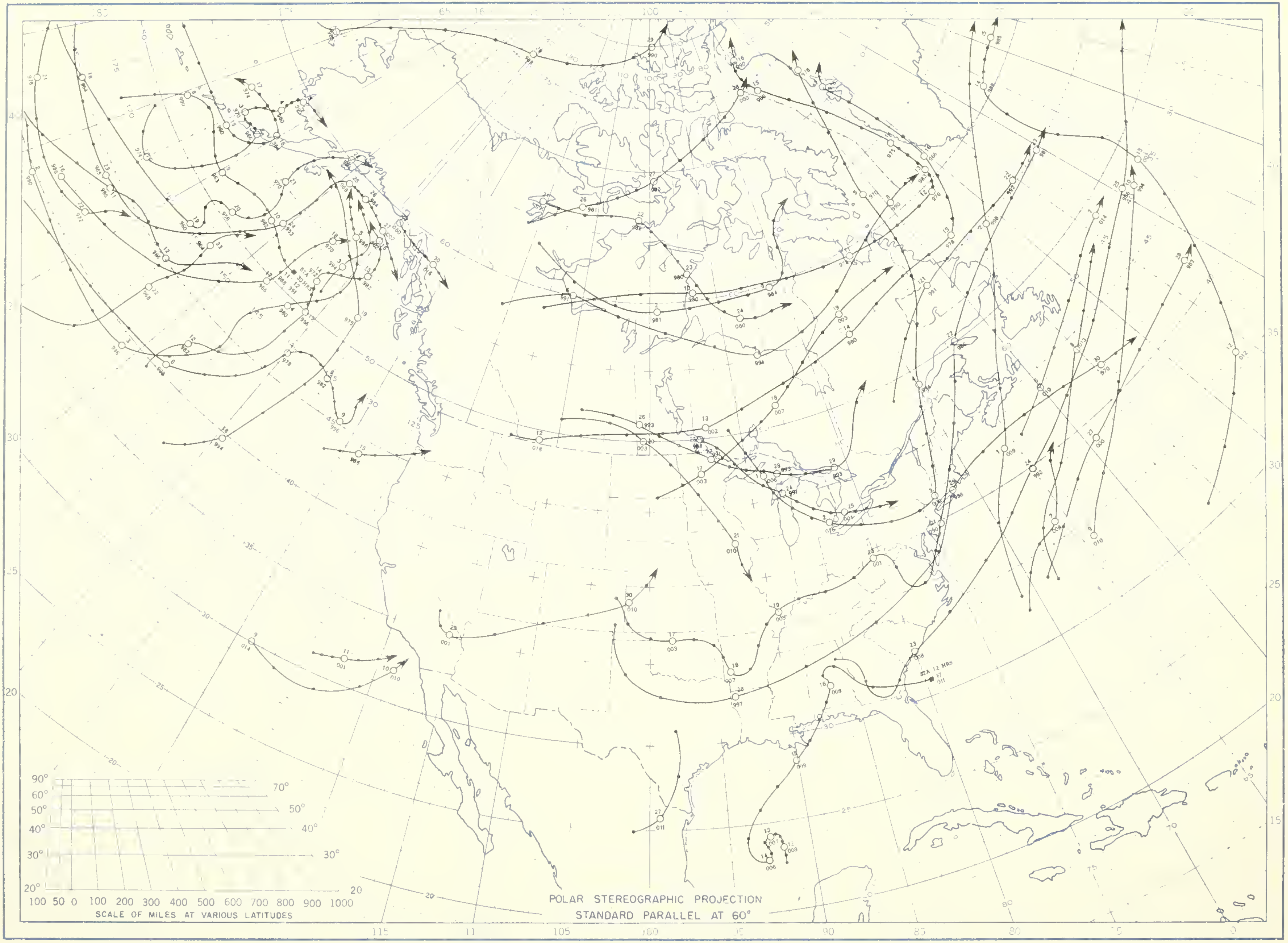
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm. $^{-2}$). Basic data for isolines are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are computed for stations having at least 9 years of record.

Chart IX. Tracks of Centers of Anticyclones at Sea Level, November 1954.



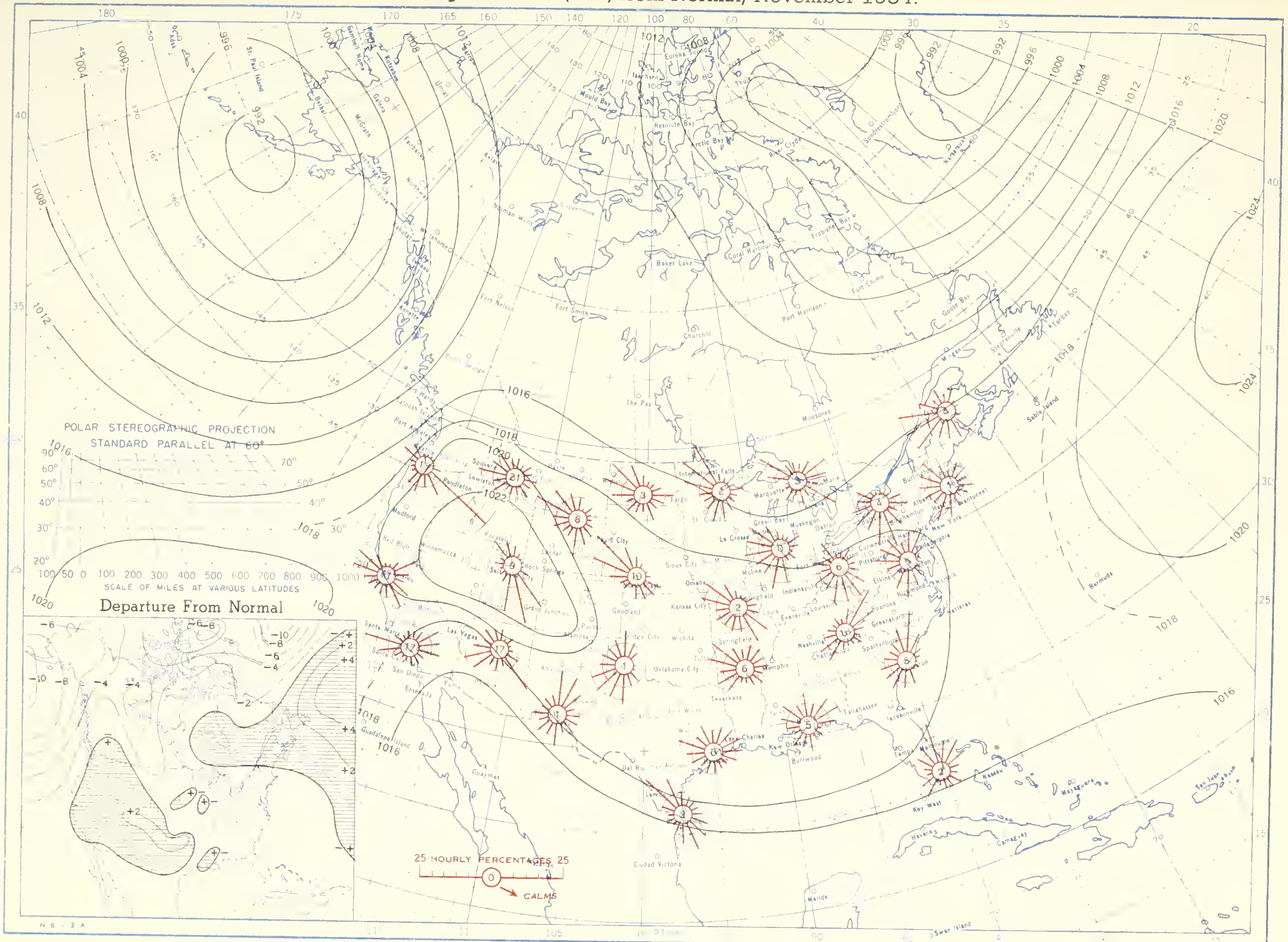
Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

Chart X. Tracks of Centers of Cyclones at Sea Level, November 1954.



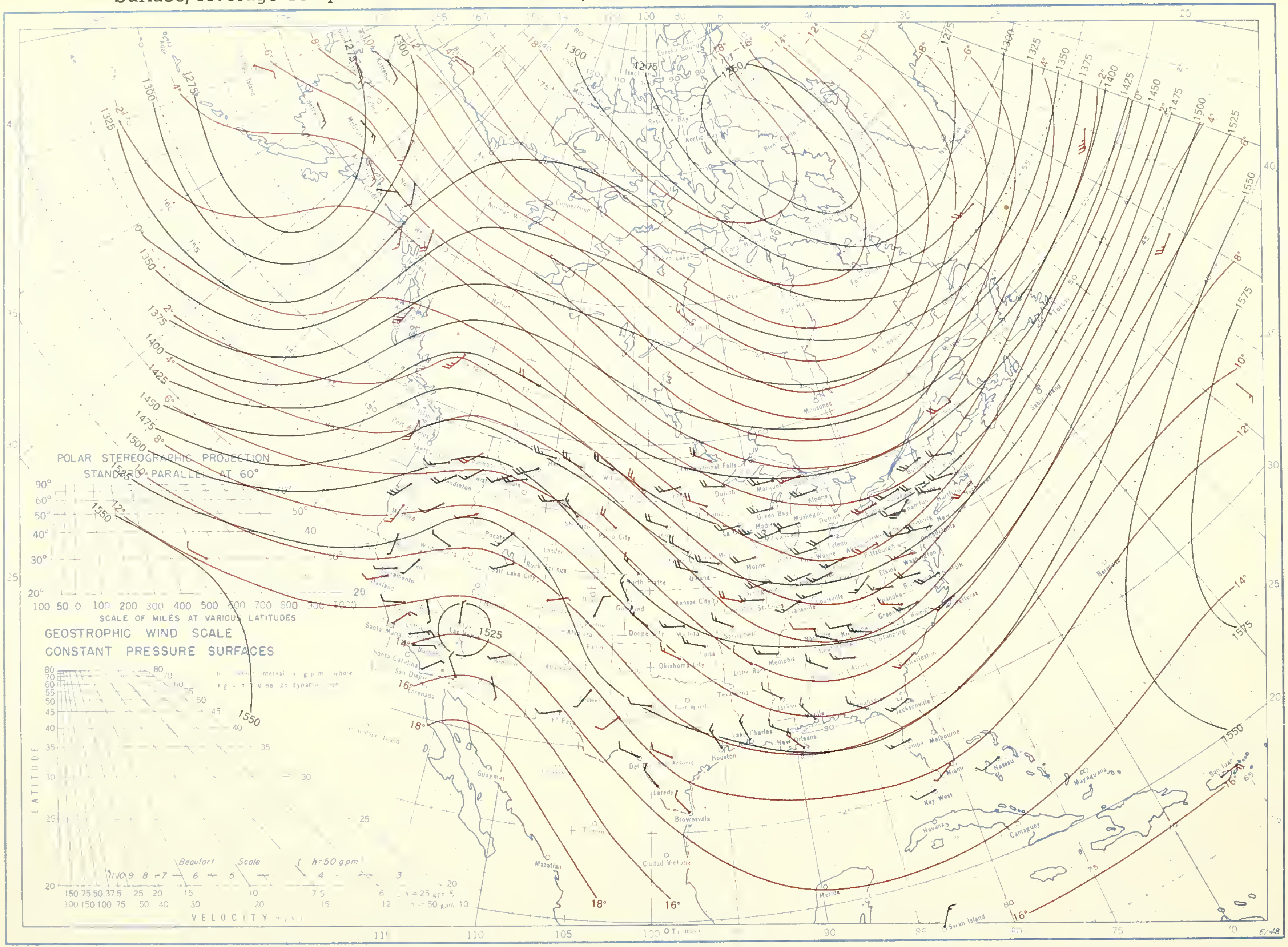
Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, November 1954. Inset: Departure of Average Pressure (mb.) from Normal, November 1954.



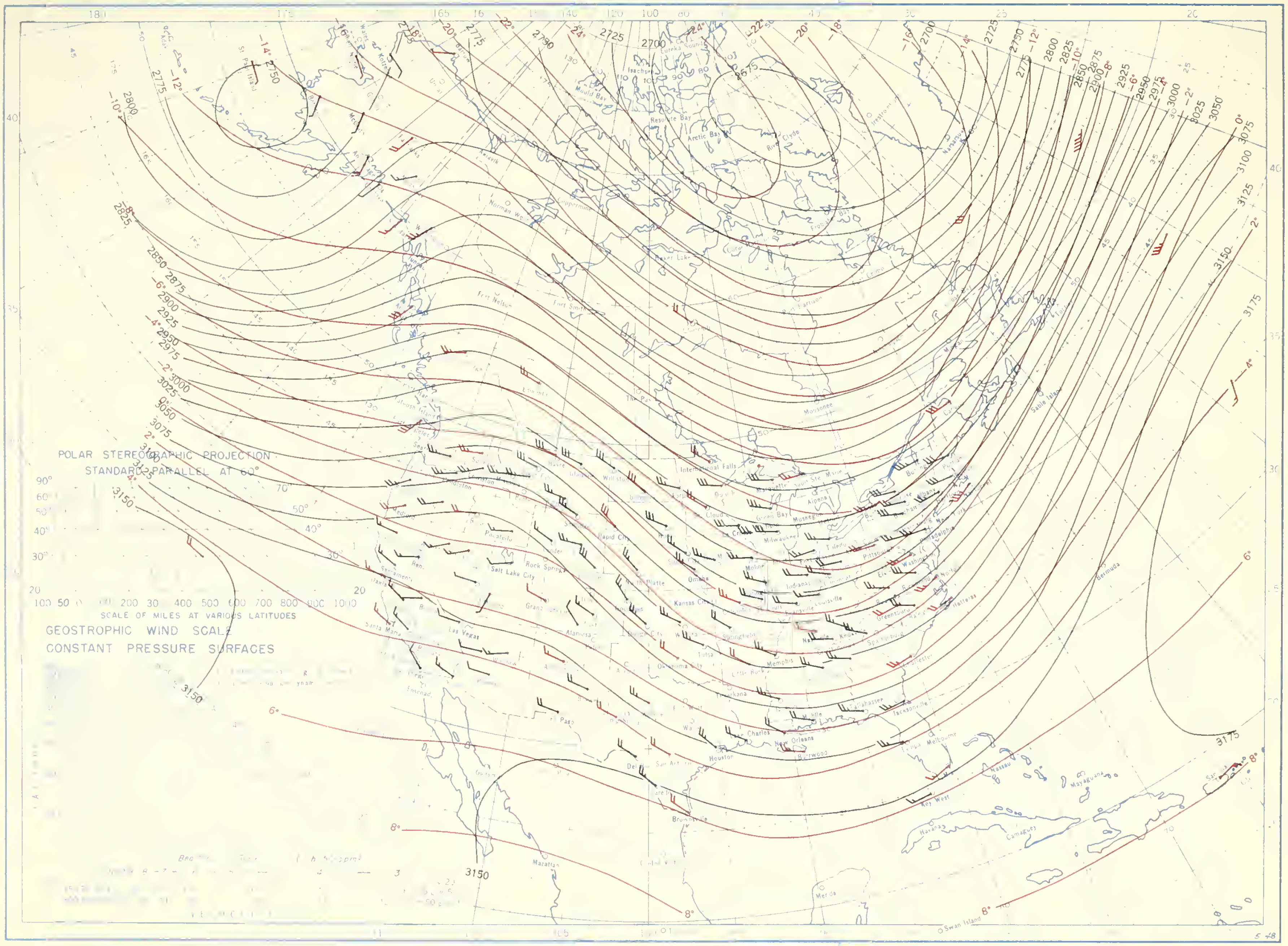
Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), November 1954.



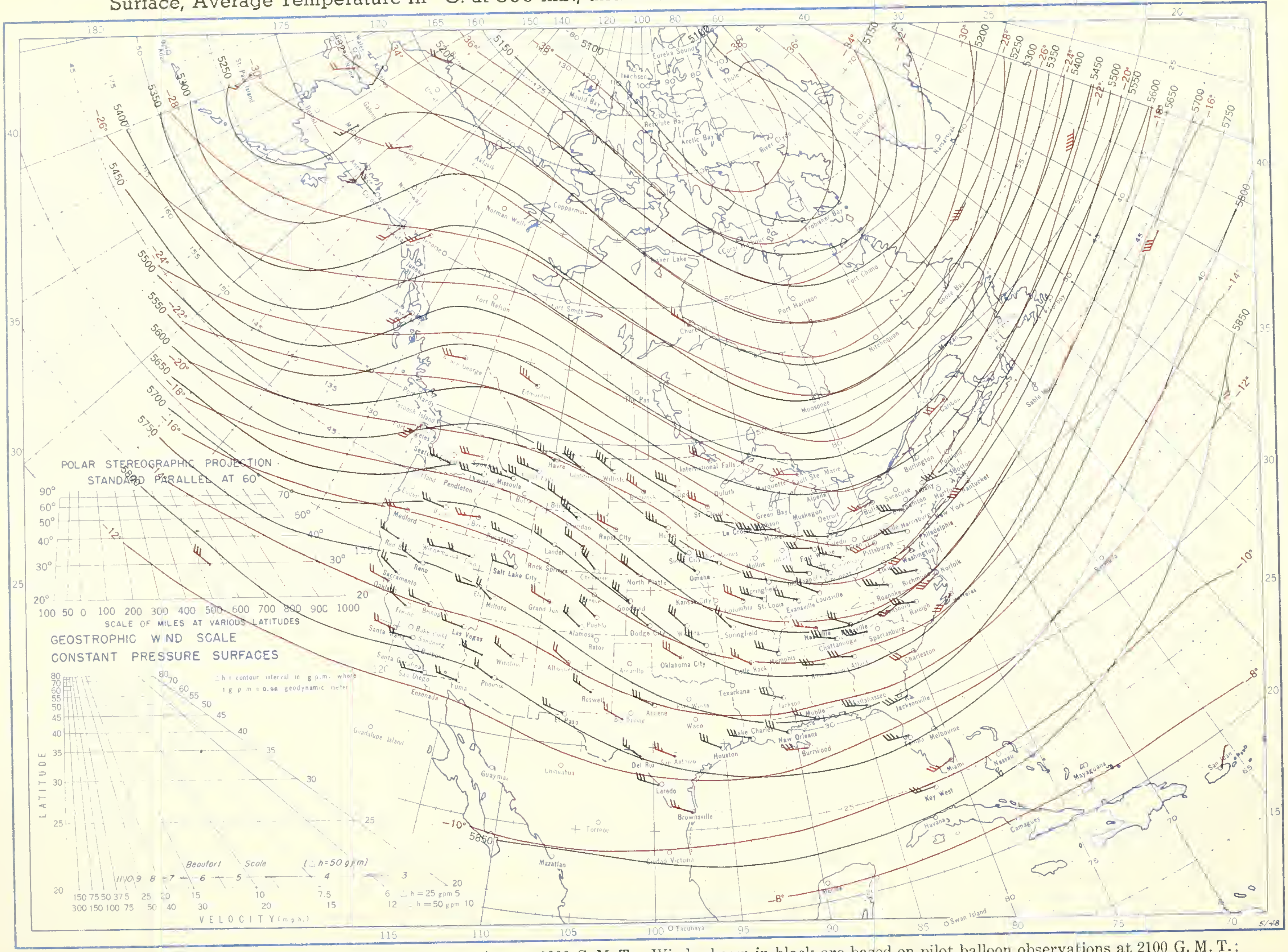
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m.. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), November 1954.



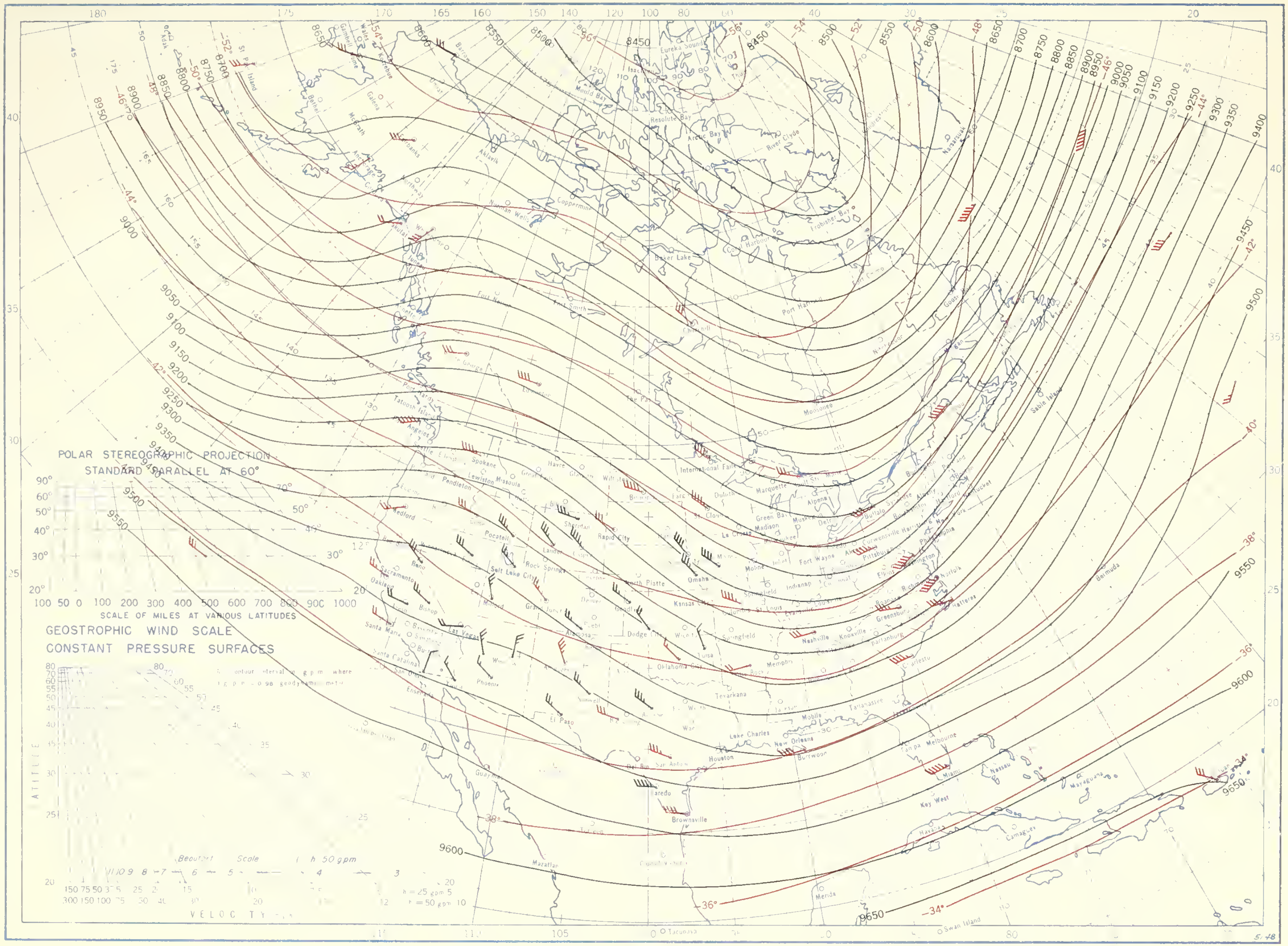
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), November 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 300-mb. Pressure Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), November 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

DECEMBER 1954
Volume 5 No. 12

ASHEVILLE: 1955

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CHARTS I-XV

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

DECEMBER 1954 — Volume 5 No. 12

GENERAL SUMMARY OF WEATHER CONDITIONS

In the northern Rocky Mountain region and northern Great Plains unusually mild, dry, sunny weather was favorable for livestock, winter grains and ranges, and resulted in considerable savings in fuel. But similar conditions in the western portions of the lower Great Plains intensified the prolonged drought situation there and grains and pastures either remained in poor condition or deteriorated further and suffered additional damage from occasional dust storms.

East of the Mississippi River moderate to heavy precipitation at well spaced intervals maintained adequate soil moisture in middle and northern areas and greatly improved soil moisture and increased stream flow in the South. Temperatures for the month averaged below normal in this area, slightly below in the North and much below in the South where frequent frost and freezes occasionally extended deep into Florida.

Temperatures also averaged below normal in California and the Great Basin, and widespread frost and freezing weather near the end of the month damaged some citrus and tender vegetation in southern portions of California and Arizona. Considerable fog occurred in this region during the latter part of the month, particularly in the Great Salt Lake Basin and the Central Valley of California.

Thunderstorms occurred in the South on the 4th, 5th, and 29th, and also in the Ohio Valley and southern Great Lakes region on the latter date. Sunshine was abundant in the Great Plains and northern Rockies, ranging up to 172 percent of normal at Brownsville, Tex., 142 at Bismarck, N. Dak., and 214 percent at Missoula, Mont., but it was below normal in California's Central Valley (25 to 41 percent of normal), the Columbia and Ohio River Valleys, and the Middle Atlantic States.

PRECIPITATION.--Precipitation was less than 50 percent of normal in the upper Mississippi Valley, most of the Great Plains, the Rocky Mountain region, and most of Florida. Miami, Fla., reported a monthly total of 0.18 inch and Devils Lake, N. Dak., 0.04 inch, both new records. Monthly totals were less than 0.10 inch in southwestern Kansas, southeastern Colorado, and the Oklahoma Panhandle, and only slightly higher totals were reported in the remainder of the western Great Plains. These small amounts of moisture were sufficient for only slight temporary relief for small grains.

In extreme eastern portions of Kansas, Oklahoma, and Texas and in most of the remaining eastern portion of the Country, except Florida, precipitation exceeded an inch. In large areas of the South Central States monthly amounts ranged from 2 to over 4 inches and fell at well-spaced intervals, allowing maximum penetration of the soil, and thereby replenishing ground water and increasing stream flow, which had been reduced to near or below the minimum of record by several months of severe drought. Southern Missouri and northern Arkansas received over twice their normal amounts, and a total of 5.32 inches at Springfield, Mo., was the second greatest December total there on record.

SNOWFALL.--At the beginning of the month heavy snow fell over a belt from South Dakota and northern Nebraska through southern Minnesota, northern Iowa, and southern Wisconsin. On the 3d a low pressure area off Newfoundland was responsible for up to 5 inches of snow on Cape Cod and the southern coast of Massachusetts. On the 5th and 6th another storm moving across the Southern States produced 1 to 4 inches of snow from northern South Carolina to New Jersey, and heavier amounts in the lower Appalachians. Considerable snow fell in the Sierra Nevada and Cascade Mountains during the second week, increasing the accumulation at Mt. Baker Lodge, Wash., from 25 to 54 inches, at Crater Lake, Oreg., from 21 to 27 inches, and at Soda Springs, Calif., from 36 to 48 inches. During the third week no important snow fell in the far West, but frequent light snow or flurries from the central and upper Mississippi Valley to the Appalachians extended the previous week's snow cover in the upper Mississippi Valley and Great Lakes region southward over most of Iowa, northern Missouri, and the Ohio Valley with depths generally amounting to only a few inches. On the 28th and 29th heavy snow fell in a 150- to 200- mile-wide belt extending from northern Texas to Lake Michigan, with depths of a foot or more occurring from eastern Oklahoma to Wisconsin. At Fort Scott, Kans., 26 inches fell during this storm with a water equivalent of 3.05 inches, and Clinton, Iowa, reported a 12-inch fall. Most of this heavy snow, which disrupted traffic for a day, had melted by the end of the period.

Snowfall of 8.8 inches at Tulsa, Okla., on the 28th and 29th was the heaviest in 10 years, and 3.6 inches at Norfolk, Va., on the 6th was the greatest early-season fall there this century. Snowfall was above normal in a rather narrow belt extending from El Paso, Tex., northeastward through lower Mich., northern N. Y., northern and eastern New England, also in the Cascade and extreme upper Sierra Nevada Mountains, and most of the state of Oregon. Tatoosh Island, Wash., had 329 percent of normal, Abilene, Tex., 860, Tulsa, Okla., 733, Peoria, Ill., 200, and Burlington, Vt., 219 percent. In most of the remainder of the Country where snowfall is a common occurrence in December, total falls were less than 50 percent of normal. Great Falls, Mont., and Kansas City, Mo., had no snowfall at all; Devils Lake, N. Dak., had only 9 percent of normal, Valentine, Nebr., 5, Louisville, Ky., 3, Wash., D. C., 3; Philadelphia, Pa., 5, and New York City, 3 percent.

TEMPERATURE.--In Central and southern areas west of the Continental Divide temperatures for the month averaged 2° to 4° below normal, and near the end of the month freezing extended to the Mexican Border. In southern Arizona minima of 18° to 19° in the Salt River Valley and 20° to 25° in the Yuma area damaged some citrus fruit and ruined the tomato crop in the latter area. Minima in the middle and low 20's over much of southern California damaged some unharvested potatoes in the upper San Joaquin Valley and a considerable acreage of unprotected citrus in the San Bernardino

Mountains; and frost nipped some tender vegetation in the Imperial Valley.

Monthly averages were also 2° to 4° below normal in the Southeast where growth of grains, pastures and other crops was slowed by the cold weather. In Florida, frost and freezing, frequent in northern sections, extended well into the central interior on the 7th damaging tender truck (cucumbers were badly damaged), and into the southern interior on the 11th, 16th, 20th, and 23d damaging more tender vegetation in that area. Freezing also killed some tender truck in the lower Mississippi Valley during the third week.

Unusually mild weather in the Great Plains and northern Rocky Mountain States, although not record breaking, persisted throughout most of the month. At Havre, Mont., the temperature averaged 31.9°, the third highest on record for December, and at San Antonio, Tex., 58.3° was the highest average since 1939. A maximum of 81° at Roswell, N. M., equaled the December record there.

Monthly minima occurred at the beginning of the month in South Dakota and southern Minnesota, during the second week at a few stations in the western Great Lakes region and eastern Kansas, on the 8th in most parts of the Carolinas and eastern Kentucky and Tennessee, about the 6th and 7th in parts of New York and New England, and elsewhere generally during the last few days of the month. The lowest temperature recorded during the month was -39° at Bondurant, Wyo., on the 27th.

Highest temperatures in the lower Mississippi Valley, the lower Great Plains and west of the Continental Divide occurred at most stations during the first week, and at most stations in the remainder of the Country during the last decade. The month's highest temperature was 92° recorded at Fontana, Calif., on the 20th.

DESTRUCTIVE STORMS.--There were two main outbreaks of tornadoes and violent winds during the month. The first occurring in Alabama on the 5th, was responsible for about 50 injuries and over $350,000 damage; the other, occurring in parts of both Mississippi and Alabama on the 28th and 29th, resulted in 37 injuries and about $375,000 damage. Also on the 28th and 29th, a hailstorm in Aplabuska and Lafayette Counties, Miss., caused additional property damage of $60,000. As the cold front along which these storms developed crossed Kentucky on the 29th, high winds in Mercer and Boyle Counties, caused property damage estimated at $13,000.

Damage estimated at $50,000, mostly to power and telephone lines, occurred in east-central Illinois on the 29th as a result of glaze. On the 6th wind, sleet, and frost in northwestern North Dakota were responsible for $25,000 damage and the death of a pilot. The costliest storm of the month, however, occurred in eastern Colorado on 16th and 18th when wind and dust damaged grains, pastures, buildings, and automobiles to the extent of $1,000,000.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

Section	Temperature								Precipitation					
			Monthly extremes								Monthly extremes			
	Average	Departure from normal	Station	Highest	Date	Station	Lowest	Date	Average	Departure from normal	Station	Greatest	Station	Least
	°F	°F		°F			°F		In.	In.		In.		In.
Alabama	45.4	-2.2	2 Stations	79	5+	Rockford	13	20	4.87	-0.16	Haleyville	9.56	Falco Open Pond Twr.	1.74
Arizona	43.1	.2	Sabino Canyon	89	3	Alpine	-12	29	.31	-1.00	Diamond Bar Ranch	1.46	27 Stations	.00
Arkansas	43.1	.3	Arkadelphia	75	23	Siloam Springs	8	30	4.75	.56	Bradford	8.49	Fountain Hill	1.52
California	44.1	-1.5	Fontana Kaiser	92	20	2 Stations	-8	26+	3.63	-.35	Klamath	20.35	7 Stations	.00
Colorado	27.2	1.2	Holly	75	4	Fraser	-36	28	.58	-.36	Wolf Creek Pass 4W	2.51	2 Stations	T
Connecticut	31.2	1.0	3 Stations	58	18	Cream Hill	2	7	5.18	1.32	Colchester	7.17	Woodbury 3W	3.48
Delaware	36.6	-.2	Lewes	68	28	Georgetown 55W	10	8	3.43	.01	Milford	3.68	Wilmington Porter Res.	2.90
Florida	57.0	-2.9	West Palm Beach	88	9	Niceville	18	21	1.73	-1.07	Secotan	4.14	Miami Bay Front	.02
Georgia	46.7	-1.6	Brooklet 1W	81	29	Blairsville Exp. Sta.	10	7	3.15	-1.07	Flat Top	12.06	Swainsboro	1.20
Idaho	24.7	-1.6	Deer Flat Dam	65	6	Island Park Dam	-33	27	1.34	-.62	Mullan Pass CAA	4.56	2 Stations	.13
Illinois	33.0	1.8	Jerseyville	67	26	Morrison	2	31	2.74	.59	Brookport Dam 52	7.7B	Quincy CAA AP	1.05
Indiana	32.5	.8	Mt. Vernon	62	26	Muncie 45E	-3	21	2.76	.04	Vincennes	E5.37	Elkhart	1.20
Iowa	28.1	3.7	2 Stations	58	25	Saratoga 2E	-10	6	.72	-.37	Dewitt	3.05	2 Stations	T
Kansas	36.3	3.4	2 Stations	81	4	Oberlin	-17	29	.55	-.30	Fort Scott	4.76	Aetna 2WNW	.00
Kentucky	36.9	.9	2 Stations	72	27+	Grayson	8	7+	4.85	1.01	Middlesboro	8.07	Carrollton Lock 1	2.27
Louisiana	52.5	-.4	Rayne	84	1	Converse	15	30	3.29	-2.18	Quarantine	9.56	Hackberry	1.19
Maine	24.7	2.4	4 Stations	55	18+	2 Stations	-9	26	5.07	1.71	Woodland	7.68	Middle Dam	2.91
Maryland	35.5	.2	Benson Police Brks.	69	28	2 Stations	3	6+	3.10	-.07	Sines Deep Creek	4.58	Vienna	1.83
Massachusetts	31.7	1.5	Walpole 15	60	18+	Birch Hill Dam	-5	23	4.98	1.35	Rochester	7.54	New Salem	2.95
Michigan	25.7	1.0	7 Stations	48	26+	Mio Hydro Plant	-22	20	1.61	-.32	Harbor Beach 3NW	4.02	Eagle Harbor Coast Gd.	.36
Minnesota	20.9	5.6	Madison	48	22	Baudette	-18	27	.27	-.50	Red Wing	1.09	Redwood Falls CAA AP	.02
Mississippi	47.1	-1.2	4 Stations	81	5	West Point 3NNW	15	20	4.46	-.85	Coffeeville	9.09	Greenville	1.41
Missouri	36.4	2.5	Elsberry	70	27	Hermitage	-9	30	3.37	1.19	Williamsville	8.44	Princeton	.22
Montana	27.9	4.9	Blackleaf	67	19	West Yellowstone	-36	28	.31	-.44	Heron 2NW	4.05	15 Stations	.00
Nebraska	32.0	4.9	Harlan County Dam	67	21	Curtis	-13	29	.22	-.45	Mullen 21NW	1.18	4 Stations	.00
Nevada	31.2	-1.5	2 Stations	70	3+	Virgin Valley	-20	27	.68	-.26	Glenbrook	4.10	Alamo	.04
New Hampshire	25.3	1.9	Nashua 3N	56	29	First Connecticut Lake	-16	23	4.00	.88	Cannon Mountain	8.41	Bath 25W	2.07
New Jersey	34.4	.6	2 Stations	65	28	3 Stations	8	3+	3.69	.08	Pleasantville 1N	6.22	Deepwater	2.38
New Mexico	36.5	.8	Jal	84	3	Gavilan	-29	28	.24	-.48	Optimo	E1.60	23 Stations	.00
New York	26.1	-.1	N.Y. Westerleigh Stat. Is.	62	28	Franklinville	-20	21	3.82	.87	Eagle Bay	7.78	Hamilton	1.57
North Carolina	40.2	-2.8	2 Stations	77	29	2 Stations	0	7+	3.63	-.10	Coweeta 8	13.63	Lake Michie	.80
North Dakota	23.2	9.2	Center	59	22	Pembina 2N	-18	31	.09	-.39	Oakes	.45	Reeder	.00
Ohio	31.9	.2	Chesapeake Huntg CAA AP	68	27	Mansfield 6W	-14	20	2.36	-.34	Summerfield 3NE	3.77	Columbus Sullivant Ave.	.71
Oklahoma	42.9	2.3	2 Stations	88	4	4 Stations	-3	29+	2.18	.45	Atoka	6.04	Arnett	.00
Oregon	33.0	-1.3	Elkton 2W	68	5	2 Stations	-22	26+	3.67	-.59	Alsea Fish Hatchery	18.34	2 Stations	.06
Pennsylvania	30.5	-.8	Phoenixville 1E	65	28	Bradford 4W Res.	-16	21	3.43	.31	Kregar 45E	6.24	Honesdale 4NW	2.07
Rhode Island	33.7	.6	Providence WB AP	57	29	Kingston	5	23	5.97	2.09	Austin	7.87	Block Island WB AP	5.57
South Carolina	44.1	-2.6	Yemassee 4W	80	30	Chester 25W	9	8	3.02	-.57	Caesars Head	11.38	Hartsville 35	1.18
South Dakota	26.7	4.7	Rapid City	65	20	Custer	-18	28	.16	-.35	Dumont 2ENE	1.71	5 Stations	.00
Tennessee	39.4	-1.4	Newport	73	29	Watauga Dam	10	8	6.03	1.47	Roddy	11.75	Hampton	2.24
Texas	51.1	3.1	Buchanan Dam	93	5	Plains	-2	29	.83	-1.21	Henderson	5.35	Numerous	.00
Utah	26.9	-.2	Zion N.P.	66	2	Woodruff	-30	28	.82	-.28	Alta	4.96	2 Stations	T
Vermont	23.1	.8	Bennington 2NW	55	28+	Enosburg Falls	-17	23	3.42	.62	Searsburg Mountain	5.46	Gilman	1.20
Virginia	36.3	-1.6	Chase City	73	29	Burkes Garden	-5	7	3.41	.30	Rose Hill	8.17	Alexandria Potomac Yards	1.94
Washington	33.9	.3	2 Stations	64	5+	Stockdill Ranch	-8	27	4.16	-.82	Spruce	21.86	Waterville	T
West Virginia	32.7	-1.9	Williamson	72	28	Kumbrabow St. Forest	-17	21	3.56	.29	Lookout 2	6.09	Knobly Mountain	1.63
Wisconsin	22.8	2.7	Beaver Dam 35W	47	24	Long Lake Dam	-17	29	.79	-.46	Racine	4.20	Spirit Falls	.12
Wyoming	24.2	1.9	Wheatland 1N	67	3	Bondurant	-39	27	.50	-.27	Snake River	3.26	10 Stations	.00
Puerto Rico	73.8	-.5	Aguirre (2)	92	4+	Utuado	51	24+	2.07	-2.37	Rio Blanco (1800 Ft. elevation)	9.80	Santa Isabel	.00

+ And also on a later date or dates.

E Water equivalent of snowfall wholly or partly estimated, using a ratio of 1 inch of water equivalent to every 10 inches of new snowfall.

Note: Dates in Table 1 apply to the period 24 hours prior to time of observation. In some cases the actual occurrence is on the calendar date preceding that shown. (See individual Climatological Data for times of observations).

CLIMATOLOGICAL DATA

Table 2

DECEMBER 1954

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
ALABAMA																																
Birmingham	610	993.6	1019.3	55	33	43.8	-1.9	73	5	22	20	0	18	33	69	5.78	0.53	3.17	11	2	T	0	6.5	WNW	41	SE	29	9	10	12	6.1	49
Mobile	211	1011.5	1019.8	62	40	51.1	-2.4	75	1	25	20	0	3	42	73	6.25	.84	1.68	9	2	0.0	0	11.6	NW	--	---	--	16	5	10	4.6	--
Montgomery	198	1012.2	1019.9	58	35	46.8	-2.6	75	29+	24	21+	0	13	37	72	4.03	-.51	3.01	10	2	.0	0	8.1	NW	32	SW	5	9	11	11	5.5	61
ARIZONA																																
Flagstaff	6993	------	------	44	15	29.5	1.1	58	2	-1	30	0	29	--	--	.61	-1.25	.46	4	0	4.3	5	----	---	--	---	--	15	8	8	4.4	--
Phoenix	1114	979.3	1018.9	68	40	54.0	1.9	79	3	24	28	0	5	31	44	.01	-.96	.01	1	0	.0	0	3.8	E	*23	NNW	27	12	6	13	5.7	81
Prescott	5014	849.3	1021.3	53	23	38.0	.2	67	2	10	28	0	28	--	--	.33	-1.04	.33	2	0	.6	T	4.6	SW	47	W	4	11	11	9	4.7	70
Tucson	2558	928.5	1017.9	69	38	53.3	1.3	84	3	18	28	0	7	20	30	.06	-.88	.06	2	0	.0	0	6.6	ESE	41	SE	19	13	4	14	5.2	85
Winslow	4880	854.7	1023.4	47	20	33.6	-.9	66	7	5	30	0	26	15	50	.13	-.40	.08	2	0	.1	T	6.3	SE	*35	SW	4	13	5	13	5.0	--
Yuma	199	1013.9	1018.9	69	43	56.4	-.7	79	3	28	29	0	3	21	28	T	-.55	T	0	0	.0	0	6.1	N	42	N	27	11	8	12	5.2	76
ARKANSAS																																
Fort Smith	458	1001.0	1018.4	54	31	42.6	.1	69	5	23	30	0	18	33	73	5.42	2.28	2.45	5	3	T	0	7.0	ENE	29	SW	16	11	7	13	5.7	51
Little Rock	257	1005.1	1018.3	54	34	44.2	.3	70	23	24	7	0	14	33	67	4.15	.07	1.76	7	2	T	0	9.1	WNW	38	N	5	8	6	17	6.3	47
Texarkana	361	------	------	59	37	47.9	-.1	73	4	25	30	0	11	--	--	3.96	-.88	2.12	7	3	T	0	----	---	--	---	--	--	--	--	---	--
CALIFORNIA																																
Bakersfield	489	1005.1	1023.6	55	38	46.3	-2.4	77	2	26	27+	0	8	38	78	.57	-.46	.34	2	0	.0	0	3.6	NW	*20	SSE	1+	6	4	21	7.1	--
Bishop	4108	878.1	1022.4	54	20	37.3	-1.8	68	22	9	28	0	31	--	--	.95	.06	.76	2	0	T	0	----	---	--	---	--	18	5	8	3.5	--
Blue Canyon	5280	840.8	1021.3	45	32	38.1	-.4	66	19	19	26+	0	20	--	--	15.25	6.50	3.56	14	0	46.8	18	----	---	--	---	--	9	7	15	6.2	--
Burbank	699	993.6	1019.9	68	42	55.1	.4	81	19	31	29	0	1	33	51	.95	-1.91	.61	3	0	.0	0	3.7	S	*27	NE	26	13	9	9	4.6	--
Eureka CO	43	1018.6	1021.0	55	42	48.2	-.4	62	2	30	27	0	2	--	--	9.65	3.56	3.03	17	0	T	0	6.8	---	33	S	5	4	7	20	7.6	49
Fresno	331	1010.8	1022.9	51	37	43.8	-2.5	72	2	25	27	0	7	39	85	1.82	.19	.92	6	0	.0	0	4.2	SE	32	SW	9	5	3	23	8.0	35
Los Angeles CO	312	------	------	67	49	58.1	.8	82	19	36	28	0	0	37	50	.86	-2.25	.43	2	0	.0	0	6.2	---	18	E	1+	13	11	7	4.2	78
Los Angeles	99	1016.3	1019.9	68	47	57.6	2.0	83	19	37	28+	0	0	38	57	.74	-1.87	.38	3	0	.0	0	5.4	NE	%36	W	9	13	9	9	4.6	--
Mt. Shasta	3544	895.7	1022.8	41	26	33.5	-1.2	52	22	9	27	0	28	--	--	6.62	1.23	2.46	15	0	35.4	12	----	---	--	---	--	5	8	18	7.2	--
Oakland	3	1022.0	1022.5	56	41	48.3	-.3	63	4	31	26	0	1	41	77	4.33	.91	1.41	9	0	.0	0	5.2	SE	*33	SE	1	10	9	12	5.9	--
Red Bluff	341	1009.8	1022.9	50	36	43.1	-3.7	62	16	27	27	0	7	36	81	5.26	1.03	2.46	14	0	.0	0	7.9	NNW	41	SE	6	6	8	17	7.0	41
Sacramento	17	1021.7	1022.8	49	38	43.5	-2.3	63	5	29	29	0	2	40	86	4.41	1.40	1.92	11	0	.0	0	7.7	SE	33	SE	1	4	5	22	8.1	25
Sandberg CO	4517	865.6	1021.3	47	35	41.1	-1.3	61	23	19	27	0	9	--	--	.86	-1.99	.44	3	0	.2	T	----	---	--	---	--	12	8	11	4.9	--
San Diego	19	1015.9	1019.1	68	48	58.2	1.3	82	20	38	28	0	0	40	58	.55	-2.02	.54	2	0	.0	0	4.8	NE	18	S	9	12	10	9	5.3	69
San Francisco CO	52	------	------	54	45	49.9	-2.0	63	4+	37	23	0	0	--	--	5.67	1.60	1.81	10	0	.0	0	7.2	---	26	SE	1	11	8	12	5.4	62
San Francisco	1	1021.0	1021.8	54	41	47.7	-1.6	63	5	32	26	0	1	42	80	4.24	.65	1.68	10	0	.0	0	8.0	SE	33	WNW	10	10	5	16	6.3	--
Santa Maria	238	1012.2	1020.8	64	40	51.9	-.5	76	18	28	27	0	2	39	67	1.88	-.73	1.00	7	0	.0	0	6.1	WNW	*25	SE	1	15	5	11	4.5	--
COLORADO																																
Alamosa	7538	772.8	1028.2	40	-2	19.2	-.2	55	3	-28	28	0	31	--	--	.13	-.04	.07	3	0	1.7	1	----	---	--	---	--	14	14	3	3.7	--
Colorado Springs	6173	810.0	1020.8	49	19	33.9	2.4	65	20	3	28	0	29	10	41	.21	-.10	.21	2	0	2.7	3	10.5	NNW	*44	N	16	13	14	4	3.9	--
Denver	5292	838.1	1019.9	49	20	34.7	3.0	67	20	-4	28	0	30	11	45	.71	.20	.68	3	0	8.6	8	10.0	S	39	N	16	15	6	10	4.2	78
Grand Junction	4849	865.2	1027.8	35	17	26.1	-2.4	43	11+	5	30	0	31	17	71	.36	-.32	.27	4	0	1.5	5	5.1	ESE	26	NW	16	12	8	11	5.1	64
Pueblo	4639	857.4	1019.9	54	18	35.6	4.5	69	3+	-1	28	0	30	14	46	.13	-.30	.13	2	0	2.8	3	8.3	W	54	W	4	13	12	6	4.2	81
CONNECTICUT																																
Bridgeport	7	1014.3	------	41	28	34.5	2.2	55	29+	16	7	0	24	--	--	4.70	1.62	2.05	9	0	1.1	1	----	---	--	---	--	7	14	10	6.0	--
Hartford	169	1007.1	1014.2	39	24	31.5	1.9	57	29	13	23	0	29	23	70	3.81	.52	1.42	8	0	2.8	3	11.5	NW	38	NW	25	4	7	20	7.4	42
New Haven	6	1010.1	1014.2	41	27	33.7	1.8	53	18	17	7+	0	24	--	--	5.84	1.90	2.25	9	0	3.4	3	8.5	---	32	E	14+	5	9	17	6.5	55
DELAWARE																																
Wilmington	73	1012.9	1016.1	43	28	35.1	.0	63	28	15	21	0	22	26	72	3.14	.15	1.13	10	0	.9	1	9.5	WNW	--	---	--	8	9	14	6.2	--
DIST. OF COLUMBIA																																
Washington CO	72	------	------	44	31	37.7	-.5	62	28+	18	21	0	17	--	--	2.73	-.02	.95	8	0	T	T	8.4	---	29	NW	30	--	--	--	---	--
Wash. Nat'l AP	14	1013.1	1017.4	44	30	37.1	-.9	63	28	18	21	0	20	26	65	2.82	.21	1.04	9	0	.1	T	10.8	WNW	32	N	6	11	5	15	6.0	47
FLORIDA																																
Apalachicola CO	13	1018.3	1019.6	61	45	52.9	-3.4	71	2	31	20	0	2	--	--	2.60	-.69	1.09	5	3	.0	0	8.4	---	31	N	6	14	4	13	5.1	52
Daytona Beach	31	1018.3	1019.9	68	43	55.7	-4.8	79	30+	27	21	0	4	47	78	1.24	-1.21	.60	5	0	.0	0	9.8	WNW	*40	NNW	6	13	10	8	4.6	--
Fort Myers	15	1019.3	1019.6	73	49	60.5	-5.1	82	31	37	22	0	0	52	78	1.93	.64	1.15	4	2	.0	0	8.3	ESE	*23	NE	6	18	8	5	3.2	--
Jacksonville CO	18	------	------	65	44	54.1	-3.6	78	28	29	7	0	3	--	--	1.78	-.61	.66	5	--	.0	0	----	---	--	---	--	--	--	--	---	--
Jacksonville AP	24	1019.3	1019.8	65	41	53.0	-3.4	78	29+	28	7	0	8	42	70	2.00	-.37	.96	5	0	.0	0	8.6	WNW	30	N	6	15	8	8	4.5	56
Key West CO	9	1018.0	1018.6	75	62	68.4	-3.4	82	31+	49	23	0	0	--	--	.81	-.97	.50	4	2	.0	0	8.1	---	20	N	7+	12	18	1	3.8	78
Lakeland CO	214	------	------	69	48	58.4	-4.1	82	31	34	20+	0	0	--	--	1.18	-.82	.63	4	1	.0	0	5.8	---	--	---	--	16	10	5	3.6	60
Miami CO	8	------	------	72	59	65.6	-3.9	78	28	40	31+	0	0	--	--	.18	-1.55	.18	1	1	.0	0	11.9	---	34	NE	7	18	11	2	3.0	83
Miami	8	1018.0	1018.9	74	55	64.2	-5.0	80	30	41	22+	0	0	54	73	.46	-1.19	.25	3	0	.0	0	9.5	N	*29	SW	14	18	10	3	3.6	--
Miami Beach	9	------	------	73	62	67.7	-3.2	80	2	44	21	0	0	--	--	.36	-1.47	.18	4	--	.0	0	----	---	--	---	--	13	12	6	---	--
Orlando	106	1015.6	1020.2	69	45	57.3	-5.4	81	31	30	21	0	2	48	78	1.80	-.29	.83	4	1	.0	0	9.0	WNW	*26	N	6	17	9	5	3.9	--
Pensacola CO	13	1017.6	------	61	44	52.6	-2.5	71	5	30	20	0	1	--	--	2.55	-1.62	.88	8	2	.0	0	----	---	32	SE	28	--	--	--	---	63
Pensacola CAA AP	118	------	1019.9	--	--	----	---	--	--	--	--	--	--	42	72	----	----	----	--	--	----	--	11.1	WNW	--	---	--	--	--	--	---	--
Tallahassee	64	1017.3	1019.8	63	37	50.2	-3.9	74	29+	24	21+	0	13	39	71	1.84	-1.84	.72	6	1	.0	0	5.6	NW	--	---	--	13	5	13	5.2	--
Tampa	19	1019.0	1020.2	69	47	57.7	-5.0	79	28	35	20+	0	0	50	79	1.85	-.11	.91	4	1	.0	0	8.8	N	*29	NNE	6	15	9	7	4.1	74
West Palm Beach	15	1018.0	1018.7	73	53	63.1	-5.6	82	31	38	22+	0	0	53	72	.95	-1.25	.59	5	1	.0	0	11.8	NW	*30	NNE	7	16	7	8	4.3	--
GEORGIA																																
Atlanta	977	977.3	1020.0	52	35	43.7	-1.5	69	28	24	21+	0	10	33	70	3.00	-1.55	.97	10	1	.1	0	10.0	NW	34	W	15	7	8	16	6.5	45
Athens	798	989.2	------	54	34	43.7	-1.5	67	28	21	7	0	15	--	--	2.49	-2.23	.99	9	1	T	0	----	---	--	---	--	8	14	9	5.5	--
Augusta	143	1012.5	1019.2	58	33	45.7	-3.6	76	29	18	8	0	17	35	71	1.88	-1.85	1.34	5	1	.0	0	7.4	W	*34	WSW	18	11	6	14	5.5	--
Columbus	385	1005.4	1020.0	58	35	46.1	-1.5	72	29+	22	21+	0	14	--	--	3.28	-1.29	1.06	11	1	.0	0	----	---	--	---	--	9	9	13	5.8	--
Macon	356	1005.1	1018.8	59	37	47.6	-2.1	74	28	25	21	0	9	34	64	2.23	-2.01	1.28	10	1	T	0	5.8	WNW	29	N	6	10	10	11	5.7	69
Rome	637	995.6	1019.3	52	29	40.6	-2.7	71	29	19	16	0	21	--	--	6.29	1.07	2.36	10	1	T	T	----	---	--	---	--	6	9	16	6.7	--
Savannah	48	1016.9	1019.5	61	36	48.4	-4.0	76	29	22	21+	0	13	38	71	3.38	.74	1.70	8	1	.0	0	9.8	W	36	N	6	13	9	9	4.9	65
IDAHO																																
Boise	2842	926.2	1025.7	39	22	30.6	-.4	56	6	7	27	0	27	22	72	1.09	-.20	.60	7	0	3.1	2	8.5	SE	36	SE	6	8	10	13	6.0	48
Idaho Falls 46W CO	4933	852.7	1028.4	30	3	16.6	-3.7	42	6	-17	27	0	30	--	--	.40	-.35	.16	5	0	2.7	1	4.9	---	a37	SW	31	--	--	--	---	--
Idaho Falls 43NW CO	4780	------	------	29	2	15.2	-2.6	42	4	-23	27	0	31	--	--	.44	-.17	.23	7	0	2.5	1	3.4	---	a30	SW	15	--	--	--	---	--
Lewiston	1413	969.5	1022.5	42	24	33.0	-1.0	54	23	10	27	0	30	--	--	.20	-1.10	.06	7	0	1.0	1	----	---	--	---	--	6	6	19	6.9	--
Pocatello	4444	867.3	1027.4	31	11	21.0	-5.8	51	6	-15	28	0	31	15	77	.45	-.69	.12	9	0	5.8	3	9.0	SW	42	W	31	8	6	17	7.1	47
ILLINOIS																																
Cairo CO	314	1004.7	------	47	33	40.0	.3	61	4+	24	20	0	14	--	--	6.30	2.97	2.10	9	1	T	T	9.9	---	36	N	5	10	7	14	6.3	46
Chicago	610	993.9	1017.3	37	27	31.9	3.9	46	26	18	19+	0	27	24	74	1.79	-.16	.65	13	1	8.2	3	11.3	SSW	34	NW	23	4	8	19	7.5	36
Moline	589	995.6	1018.6	36	22	29.1	2.2	47	4+	5	30	0	30	25	81	2.02	.45	.86	10	0	16.2	8	9.8	WNW	35	NE	29	7	6	18	6.9	34
Peoria	654	994.6	1017.6	37	25	31.1	2.5	51	26	13	30	0	29	26	79	1.80	-.24	.72	10	1	8.2	3	11.2	---	41	NE	29	6	6	19	7.3	34
Springfield	587	993.9	1018.0	40	27	33.5	2.9	58	26	16	19+	0	27	28	79	1.87	-.16	.73	9	0	2.9	1	14.4	S	34	NW	9	6	3	22	7.6	32
INDIANA																																
Evansville	383	1002.7	1019.1	44	30	36.9	.0	60	26	23	7+	0	24	30	79	3.92	.74	1.38	12	0	3.3	1	10.4	SE	54	N	5	6	5	20	7.5	30
Fort Wayne	801	984.8	1017.0	37	24	30.5	1.7	50	27	11	20+	0	29	26	83	2.06	-.20	.84	14	1	2.3	1	12.0	S	36	W	23	2	6	23	8.3	32
Indianapolis	793	988.2	1018.0	39	25	32.2	1.1	56	26	10	20	0	29	26	79	2.10	-.69	1.02	13	0	2.4	1	12.8	SSE	35	SW	9	6	5	20	7.5	38
South Bend	768	988.2	1017.2	36	23	29.4	1.6	45	26+	8	21	0	29	25	82	2.80	.52	.82	14	1	23.9	16	8.0	S	*23	E	29	3	7	21	7.8	--

See footnotes at end of table.

CLIMATOLOGICAL DATA

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
IOWA																																
Burlington	694	991.9	1018.4	38	23	30.3	2.4	52	11	6	30	0	29	25	79	1.01	-0.67	0.40	9	1	7.1	6	10.7	WNW	38	W	9	7	5	19	7.2	48
Des Moines	948	986.5	1019.0	37	22	29.4	3.2	52	25	9	30	0	29	23	79	.78	-.36	.20	8	0	5.4	3	13.5	NW	38	NW	14	4	12	15	7.1	41
Dubuque	1065	977.3	1017.8	32	19	25.1	1.7	41	23+	7	29	0	31	22	83	1.55	.20	.58	13	0	11.2	4	----	---	--	---	--	6	8	17	7.1	--
Sioux City	1094	975.6	1018.8	37	19	27.9	4.5	53	22	11	10+	0	31	21	75	.12	-.62	.12	1	0	1.2	1	12.3	NNW	42	S	24	6	10	15	6.7	53
KANSAS																																
Concordia CO	1375	967.2	------	46	25	35.5	3.7	61	20	14	13+	0	28	--	61	.49	-.12	.39	5	0	1.0	1	8.0	---	27	N	14	11	14	6	4.5	66
Dodge City	2594	928.2	1018.2	50	24	37.2	3.8	69	4	1	29	0	28	19	54	.04	-.46	.02	3	1	.6	1	16.1	N	50	N	18	10	10	11	5.1	72
Goodland	3645	888.3	1018.6	47	17	32.2	3.6	64	3+	-7	29	0	31	16	56	.23	-.24	.21	2	0	3.0	3	10.5	NW	*26	NNW	16+	14	8	9	4.5	--
Topeka	879	981.7	1018.8	46	24	34.8	2.6	65	25	12	13	0	29	25	68	1.21	.05	.97	5	0	1.8	1	10.7	N	41	NE	4	12	7	12	5.4	54
Wichita	1321	967.8	1018.0	49	25	37.3	1.8	65	3+	11	13	0	28	24	64	.18	-.92	.12	4	0	.2	T	13.4	N	37	S	25	10	12	9	5.0	76
KENTUCKY																																
Lexington	979	981.7	1018.4	42	28	35.2	.3	65	27	14	20	0	23	28	79	3.38	-.30	.92	12	0	1.6	1	14.5	SSE	--	---	--	7	4	20	7.1	--
Louisville CO	457	------	------	44	32	37.8	.2	60	27	22	20	0	18	--	--	3.57	.26	1.33	11	1	T	T	----	---	--	---	--	--	--	--	---	--
Louisville	474	1001.7	1018.2	44	30	37.0	.1	60	28+	20	22	0	20	29	75	3.87	.57	1.35	12	1	.1	T	9.3	SE	38	SW	29	6	3	22	7.7	28
LOUISIANA																																
Baton Rouge	64	1016.3	1019.1	65	40	52.9	-.7	80	1	26	14	0	8	42	70	3.51	-1.74	1.37	9	2	.0	0	8.9	ESE	--	---	--	14	6	11	5.1	--
Lake Charles	12	1018.3	1019.4	66	44	55.3	1.3	78	1+	31	30	0	3	44	70	2.88	-2.88	1.32	4	2	.0	0	8.9	ESE	*46	E	12	11	11	9	5.2	--
New Orleans CO	9	1017.6	------	65	48	56.5	-.6	81	1	39	7+	0	0	--	--	5.88	1.30	2.02	8	1	.0	0	7.0	---	24	W	18	15	4	12	4.8	55
New Orleans	3	1017.6	1019.6	65	44	54.6	-1.5	78	1+	29	20	0	3	46	74	6.02	1.35	2.18	8	1	.0	0	10.4	SSW	*34	S	28	16	6	9	4.6	--
Shreveport	252	1009.1	1018.8	63	39	50.8	1.6	76	1+	26	30	0	8	39	68	3.66	-1.17	1.94	7	3	T	0	11.4	WNW	--	---	--	9	9	13	5.7	65
MAINE																																
Caribou	624	987.6	1011.9	26	12	18.9	4.3	43	19	-8	26	0	31	14	78	5.01	2.78	1.00	19	0	49.4	30	11.1	WNW	*38	NW	1	2	7	22	8.2	--
Portland	61	1008.7	1012.7	36	19	27.4	2.3	52	18	-3	23	0	31	22	79	5.32	1.53	2.56	15	0	15.8	7	10.5	N	47	SE	18	5	4	22	7.5	51
MARYLAND																																
Baltimore CO	14	------	------	44	31	37.6	-1.2	64	28	18	21	0	17	--	--	2.87	-.08	1.18	8	--	----	--	----	---	--	---	--	--	--	--	---	--
Baltimore	146	1012.4	1017.2	43	27	35.0	-.7	62	28	14	21	0	23	25	70	2.72	-.23	.89	9	0	.4	T	10.3	WNW	42	NW	30	10	6	15	5.9	44
Frederick	294	------	------	42	26	34.0	-1.0	61	28	15	21	0	21	--	--	3.48	.56	1.01	8	--	----	--	----	---	--	---	--	--	--	--	---	--
MASSACHUSETTS																																
Blue Hill Obs.	629	988.9	1013.0	39	24	30.6	1.5	56	18	10	23	0	27	--	74	5.69	1.79	1.29	14	0	18.7	13	17.2	NW	51	SSE	10	4	15	12	6.5	41
Boston	15	1008.8	1013.4	41	28	34.4	1.6	57	29+	16	23	0	22	24	67	5.40	2.03	1.88	13	0	10.3	6	16.4	WNW	*49	E	14	4	11	16	7.3	53
Nantucket	43	1012.8	1013.3	43	31	36.7	1.5	54	30+	18	23	0	21	32	82	6.39	2.59	1.61	17	4	19.9	9	14.8	WNW	46	SE	14	2	8	21	8.1	32
Pittsfield	1153	969.3	1013.2	33	18	25.3	.5	53	29	5	6	0	31	--	--	3.62	.57	1.15	12	--	6.3	3	----	---	--	---	--	--	--	--	---	--
MICHIGAN																																
Alpena CO	587	993.2	------	31	20	25.1	-.6	38	8	0	20	0	30	--	--	1.68	-.07	.43	16	0	21.9	9	9.4	---	31	SE	17	3	7	21	8.0	24
Detroit	619	989.2	1016.8	35	25	29.7	.2	48	26	9	20	0	29	24	79	1.72	-.48	.51	17	1	6.6	1	10.3	N	32	WNW	2	4	6	21	7.6	30
Detroit (Willow Run)	722	987.1	1016.6	35	24	29.3	.6	47	26	5	20	0	29	24	80	1.62	-.42	.57	13	0	6.2	2	11.0	SW	*34	E	29	4	6	21	8.2	--
East Lansing CO	856	------	------	34	22	28.0	.9	47	26	5	21	0	29	--	--	2.71	.59	.96	18	0	10.9	3	5.3	---	17	NE	29	--	--	--	---	26
Escanaba CO	594	993.6	------	31	21	26.2	3.8	38	25+	14	13+	0	30	--	--	.39	-1.04	.26	7	0	4.0	2	10.4	---	36	N	18	3	4	24	8.1	22
Grand Rapids	681	990.5	1016.8	34	23	28.3	1.0	44	26	6	19+	0	30	24	83	2.15	-.02	.71	18	1	12.3	4	9.1	SSW	33	NE	29	2	6	23	8.4	25
Marquette CO	677	988.8	------	30	21	25.6	2.5	39	25	14	7+	0	31	--	72	.90	-1.14	.17	17	0	8.6	5	7.6	---	25	SW	25	2	3	26	8.7	24
Muskegon	627	992.9	1016.9	34	24	29.3	.1	42	26	11	6+	0	29	23	76	2.37	.44	.81	15	1	14.8	5	----	---	--	---	--	1	1	29	9.1	--
Sault Ste. Marie	721	993.9	1017.2	28	14	21.2	1.3	38	26	-3	20	0	31	16	77	.73	-1.57	.23	9	0	7.2	4	7.7	N	*20	NW	28	4	5	22	7.9	26
MINNESOTA																																
Duluth	1409	974.3	1017.5	26	13	19.3	6.1	37	23	-2	27	0	31	14	81	.26	-.94	.12	5	0	4.2	5	11.3	NW	36	W	23	6	4	21	7.2	44
Intern'l Falls	1179	972.2	1017.7	26	7	16.4	7.3	42	22	-17	27	0	31	12	79	.19	-.66	.06	6	0	2.6	8	8.6	---	--	---	--	7	3	21	7.3	--
Minneapolis	830	983.7	1019.0	29	18	23.4	4.0	38	23+	6	6	0	31	19	84	.33	-.52	.08	8	0	4.0	6	9.7	SE	34	NW	23	6	9	16	6.9	41
Rochester	1017	979.7	1018.5	29	16	22.4	3.4	38	25	-5	6	0	31	18	81	.56	-.46	.15	7	0	5.2	6	8.1	NW	--	---	--	7	4	20	7.0	--
St. Cloud	1034	978.3	1018.2	28	14	21.2	5.7	38	23	2	6	0	31	17	83	.21	-.48	.10	6	0	2.3	3	6.5	NW	--	---	--	6	6	19	6.8	--
MISSISSIPPI																																
Jackson	315	1007.1	1019.1	61	37	48.5	-.5	75	5	25	20+	0	12	37	67	3.61	-1.99	1.94	10	2	T	0	9.3	SSE	56	NW	5	10	8	13	5.6	56
Meridian	294	1005.8	------	61	33	46.6	-1.6	79	5	20	20+	0	16	--	--	4.24	-1.30	1.38	8	1	.0	0	----	---	--	---	--	13	9	9	4.9	--
Vicksburg CO	234	1009.8	------	60	41	50.8	.3	73	5	26	7	0	5	--	--	1.76	-3.62	.82	9	2	T	0	9.6	---	33	NW	5	9	9	13	6.0	59
MISSOURI																																
Columbia	778	988.5	1017.7	44	27	35.5	2.4	64	26	8	30	0	26	26	71	1.59	-.48	.73	8	2	7.1	7	11.3	SSE	40	W	9	7	5	19	6.6	41
Kansas City	741	982.4	1018.4	45	29	36.9	3.2	64	25	20	13+	0	26	25	65	.67	-.83	.39	4	0	T	T	9.5	S	33	W	14	10	7	14	5.9	42
St. Joseph	809	------	------	43	24	33.7	2.5	63	25	11	30	0	28	--	--	.38	-1.01	.22	5	0	3.4	2	----	---	--	---	--	--	--	--	---	--
St. Louis CO	465	997.0	------	44	31	37.4	1.2	62	26	23	20+	0	20	--	--	2.27	-.16	.96	11	0	.7	T	12.2	---	31	SW	26	5	6	20	7.5	44
St. Louis	552	997.0	1017.9	44	30	36.7	1.6	67	26	20	20	0	25	28	72	1.90	-.19	1.02	11	0	T	T	10.6	S	--	---	--	5	5	21	7.4	--
Springfield	1265	968.8	1017.7	46	28	36.7	1.0	63	26	10	30	0	25	29	77	5.32	3.15	2.05	10	3	4.9	3	14.0	SSE	45	N	5	11	4	16	6.1	45
MONTANA																																
Billings	3568	891.3	1018.3	45	24	34.3	7.1	60	22	3	30	0	27	16	49	.14	-.44	.14	1	0	1.0	1	13.7	WSW	47	W	15	8	11	12	5.8	70
Glasgow CO	2090	940.1	1017.0	42	15	28.7	12.4	59	22	-6	30	0	31	17	66	.25	-.28	.17	4	0	2.7	2	----	---	--	---	--	11	4	16	5.9	--
Great Falls	3664	887.2	1016.7	43	26	34.6	8.1	55	21+	-4	30	0	23	14	46	T	-.70	T	0	0	T	T	23.2	SW	52	SW	30	13	9	9	4.7	62
Havre CO	2488	925.2	1016.3	44	20	31.9	11.5	57	19+	-4	30	0	27	--	--	.04	-.52	.04	2	0	1.5	1	10.9	---	37	SW	28	13	5	13	5.3	56
Helena	3893	874.7	1023.1	33	13	23.0	.3	47	6	-8	1	0	31	14	71	.13	-.51	.09	2	0	.3	4	6.5	W	43	SW	31	8	13	10	5.7	59
Kalispell	2965	------	------	35	22	28.2	3.5	45	6	6	2	0	30	--	--	.32	-1.22	.17	8	0	1.3	1	----	---	--	---	--	1	8	22	8.4	--
Miles City	2629	931.8	1018.7	42	17	29.4	8.7	60	22	-4	30	0	31	19	00	.05	-.46	.03	3	0	.6	1	8.0	SSE	--	---	--	15	8	8	4.6	--
Missoula	3200	905.5	1024.3	34	17	25.4	1.8	48	6	5	28	0	31	19	78	.38	-.65	.25	9	0	2.0	1	3.4	E	30	S	30	5	3	23	7.9	47
NEBRASKA																																
Grand Island	1841	950.2	1018.5	44	21	32.3	5.3	64	22	5	29	0	31	21	69	.24	-.31	.20	3	0	.4	T	11.6	NNW	--	---	--	12	8	11	5.3	--
Lincoln CO	1184	------	------	43	24	33.3	4.2	59	22	11	29	0	31	--	--	.51	-.35	.42	3	0	.8	T	9.5	---	32	NW	14	11	10	10	5.0	65
Norfolk	1544	961.4	1018.9	41	18	29.6	5.9	61	22	6	29	0	31	21	71	.08	-.70	.07	2	0	.7	1	----	---	--	---	--	9	9	13	5.7	--
North Omaha	1323	968.5	------	39	21	29.9	----	55	3	10	29	0	31	--	--	.04	----	.03	2	--	.6	1	----	---	--	---	--	--	--	--	---	--
North Platte	2779	916.7	1018.6	45	16	30.5	3.3	64	22	-6	29	0	31	20	70	.10	-.30	.08	3	0	1.5	1	11.8	WNW	43	N	16	11	6	14	5.2	60
Omaha	978	977.3	1018.8	41	22	31.6	4.2	56	3	12	29	0	31	22	69	.07	-.74	.05	2	0	.7	T	12.2	N	35	N	18	10	7	14	5.7	51
Scottsbluff	3950	879.4	1019.5	46	19	32.6	5.6	61	24	-10	1	0	30	18	61	.21	-.22	.18	4	0	1.7	4	11.1	WNW	--	---	--	11	10	10	4.8	--
Valentine CO	2581	923.5	------	41	20	30.7	4.8	58	24	0	2	0	31	--	--	.06	-.40	.03	3	0	.3	8	8.2	---	29	NW	16	12	4	15	5.9	64
NEVADA																																
Elko	5075	849.3	1026.1	38	11	24.3	-2.6	53	2	-8	28	0	30	16	74	.80	-.25	.44	7	0	4.3	1	4.8	ENE	*24	WSW	31	11	6	14	5.7	--
Ely	6257	811.4	1024.9	40	11	25.8	-1.1	55	23	-9	28	0	31	15	65	.59	-.29	.28	4	0	6.3	4	12.7	---	38	S	9	13	7	11	4.9	65
Las Vegas	2162	955.0	1021.7	56	32	43.8	-3.0	65	4	20	28	0	21	22	46	.24	-.34	.16	3	0	.0	0	5.6	W	*39	NNW	27	15	9	7	4.2	82
Reno	4397	865.6	1023.6	44	20	32.2	-1.0	57	23	7	27	0	29	23	71	1.49	.55	.84	8	0	4.0	2	4.2	WNW	40	SE	13	12	9	10	5.1	77
Winnemucca	4299	872.3	1025.4	42	12	27.0	-3.0	53	6	-13	27	0	28	18	69	.61	-.39	.31	6	0	.9	1	7.5	---	31	W	6	12	7	12	5.6	59
NEW HAMPSHIRE																																
Concord	339	1002.0	1013.1	36	17	26.3	2.3	54	29	-3	23	0	29	19	73	3.38	.57	1.08	12	0	11.3	7	7.3	NW	34	NE	14	4	8	19	7.1	32
Mt. Washington	6262	793.8	1003.0	19	3	11.3	2.4	35	18	-9	5	0	31	--	82	9.07	3.22	2.30	27	0	83.7	18	39.0	W	*142	SE	15	4	6	21	7.8	33

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
NEW JERSEY																																
Atlantic City CO	8	1013.8	------	43	31	37.1	-1.1	55	30	16	21+	0	17	--	--	3.68	0.37	1.26	10	0	0.7	1	16.7	---	61	NE	14	9	8	14	6.1	48
Newark	11	1014.7	1015.3	42	28	35.2	1.2	62	28	16	21+	0	21	24	64	2.89	-.21	1.07	8	0	T	T	12.3	WNW	*40	NE	14	7	8	16	6.6	--
Trenton CO	56	1007.6	1014.8	42	29	35.2	.2	60	30+	16	21	0	19	--	--	2.50	-.28	.86	7	0	T	T	9.7	---	*31	N	6	9	9	13	6.2	49
NEW MEXICO																																
Albuquerque	5310	851.7	1021.3	48	25	36.1	.1	65	7	8	29	0	25	17	49	.14	-.45	.14	1	0	1.4	T	6.9	N	41	W	4	16	5	10	4.1	74
Clayton	4969	845.2	1018.2	53	23	38.1	3.0	70	4+	4	28	0	26	--	--	.04	-.32	.04	1	0	.4	T	----	---	--	---	--	14	6	11	4.8	--
Roswell	3612	895.7	1019.8	58	24	41.0	.2	81	4	4	29	0	25	19	46	.27	-.26	.24	3	0	2.5	3	7.6	---	57	NW	16	15	11	5	3.9	--
NEW YORK																																
Albany	277	1010.8	1014.4	35	21	27.9	1.5	52	29	7	6	0	31	21	73	3.36	1.19	1.38	9	0	1.7	1	9.5	WNW	33	NW	16	3	6	22	7.9	32
Binghamton	1601	953.7	1014.3	31	20	25.1	-.3	49	27	5	20	0	30	20	81	3.31	.71	1.02	23	0	17.1	7	12.8	WNW	37	NW	30	0	7	24	8.8	20
Buffalo	693	987.2	1015.8	34	24	28.7	-.3	50	28	7	22+	0	29	24	80	5.83	2.91	1.04	24	2	31.2	6	13.1	WSW	43	W	30	0	7	24	8.7	19
New York CO	10	1003.1	------	42	30	35.8	.1	60	28	16	21+	0	19	--	--	3.93	.86	1.34	7	0	T	T	14.7	---	49	S	18	8	10	13	6.1	60
New York	19	1013.4	1015.2	42	31	36.5	.8	58	28	16	21	0	16	24	62	4.42	1.42	1.56	9	0	.2	T	15.0	WNW	50	NE	14	7	9	15	6.5	--
Rochester	543	995.3	1015.2	33	22	27.7	-.5	51	28	7	20	0	30	23	81	3.38	.98	.75	23	2	23.4	14	10.3	WSW	35	W	30	1	4	26	8.6	31
Schenectady	217	------	------	35	23	28.9	3.0	51	28	10	21	0	31	--	--	2.98	.55	1.25	8	0	1.8	1	----	---	--	---	--	11	10	10	5.4	--
Syracuse	424	993.1	1016.0	33	22	27.6	-1.5	54	28	6	6	0	28	22	76	4.03	1.29	1.09	23	1	20.0	10	9.1	WNW	34	W	8	1	8	22	8.6	34
NORTH CAROLINA																																
Asheville CO	2203	------	------	46	29	37.1	-3.1	63	29	15	7	0	24	--	--	2.58	-.38	1.08	14	0	2.8	2	9.4	---	30	NW	10+	9	6	16	6.3	54
Asheville	2093	------	1019.1	--	--	----	---	--	--	--	--	--	--	27	74	----	----	----	--	--	----	--	5.1	SSE	--	---	--	--	--	--	---	--
Charlotte	753	990.2	1018.7	52	32	41.8	-1.2	69	29	19	7	0	18	30	68	4.31	.52	1.67	11	1	T	T	8.9	NNE	57	NE	6	9	8	14	6.0	60
Greensboro	891	986.2	1019.1	48	28	38.1	-2.0	70	29	15	8	0	24	28	71	3.33	.22	1.32	8	0	1.0	1	7.1	SW	45	SSW	30	10	10	11	5.5	73
Hatteras	4	1017.7	1018.2	53	40	46.5	-3.0	67	29	27	23+	0	5	37	71	7.48	2.39	2.66	8	4	.6	0	13.1	NW	44	SW	9	11	9	11	5.1	54
Raleigh	438	1002.4	1018.5	51	29	40.0	-2.4	74	29	14	22	0	21	29	68	2.09	-1.32	1.44	6	0	2.4	2	8.1	SW	--	---	--	10	9	12	5.6	72
Wilmington	30	1017.7	------	56	34	44.9	-3.7	74	29+	20	8+	0	17	--	--	2.84	-.62	1.37	8	0	.3	T	9.0	---	42	NE	6	13	12	6	4.2	70
Winston-Salem	967	982.5	1018.7	48	30	38.6	-2.0	68	29	17	7	0	23	27	66	4.42	1.19	1.83	10	0	2.0	T	7.1	NW	*40	WSW	30	12	9	10	5.4	--
NORTH DAKOTA																																
Bismarck	1650	955.0	1017.6	36	14	24.9	9.4	56	22	-6	30	0	31	18	76	.06	-.34	.04	4	0	.9	1	9.2	WNW	36	NW	23	9	5	17	6.0	68
Devils Lake CO	1471	961.1	------	29	13	21.0	9.8	45	22	-7	30	0	31	--	--	.04	-.44	.02	2	0	.6	2	8.3	---	26	W	23	8	9	14	6.4	56
Fargo	895	982.1	1018.1	27	12	19.7	6.8	40	22	-6	30+	0	31	16	81	.25	-.35	.16	3	0	3.3	3	13.2	SSE	40	NW	23	7	6	18	7.1	53
Williston CO	1877	946.8	1016.7	36	18	27.0	11.3	55	22	-5	27+	0	30	20	77	.11	-.43	.04	5	0	1.1	1	6.2	---	22	NW	22	10	8	13	5.9	65
OHIO																																
Akron	1210	978.3	1017.6	36	23	29.3	-.8	54	27	4	20	0	30	23	79	1.74	-.84	.52	16	1	6.9	3	13.0	WNW	--	---	--	0	10	21	8.1	--
Cincinnati Obs.	761	------	------	41	29	34.8	-.2	58	28+	16	22	0	24	--	--	2.71	-.13	1.19	12	0	3.9	1	7.6	---	28	SW	29	--	--	--	---	32
Cincinnati	869	885.1	1018.0	40	28	34.0	.4	58	27	13	22	0	25	27	76	2.86	.03	1.30	12	0	5.2	2	10.7	SSW	*32	SW	29	6	4	21	7.6	--
Cleveland CO	663	------	------	39	29	33.9	1.0	57	27	15	22+	0	26	--	--	1.77	-.55	----	20	--	----	--	----	---	--	---	--	--	--	--	---	--
Cleveland	787	988.5	1016.8	38	26	32.1	1.2	56	27	8	20	0	28	25	76	2.33	.04	.47	22	1	11.6	4	11.7	WNW	33	W	30+	1	6	24	8.7	21
Columbus CO	724	------	------	39	28	33.1	-.2	57	27	9	20	0	21	--	--	1.49	-.95	.57	11	--	1.3	1	----	---	--	---	--	--	--	--	---	--
Columbus	815	987.1	1018.1	39	26	32.3	.6	57	28	6	22	0	27	26	78	1.69	-.80	.77	14	1	1.5	1	10.0	SSE	33	SW	9	2	8	21	8.1	33
Dayton	1002	980.4	1017.8	38	26	31.9	.2	55	28	10	21	0	28	26	81	2.18	-.29	1.29	12	1	4.4	2	10.1	S	33	SW	26	5	5	21	7.8	41
Portsmouth CO	715	------	------	41	27	34.0	-.8	64	27	11	22+	0	25	--	--	2.46	-.16	.77	12	0	6.1	2	5.9	---	44	SW	29	2	2	17	8.3	--
Sandusky CO	603	993.9	------	37	28	32.5	1.0	52	27	10	20	0	26	--	--	1.51	-.65	.57	14	1	3.5	1	8.0	---	36	SW	30	3	9	19	7.9	28
Toledo	622	993.2	1017.2	36	24	30.2	1.3	52	28	3	20	0	30	25	81	1.29	-1.00	.72	11	1	2.4	1	11.4	SW	40	E	29	4	4	23	8.0	25
Youngstown	1178	973.2	1017.0	36	23	29.1	-.9	55	28+	8	21	0	30	25	83	3.47	.53	.75	24	1	16.2	4	11.9	W	*40	WSW	30	1	8	22	8.4	--
OKLAHOMA																																
Oklahoma City	1280	973.9	1018.6	53	29	41.4	1.2	75	4	11	30	0	23	27	61	1.34	-.14	.55	7	1	5.6	4	13.4	NNW	40	NW	18	15	6	10	4.4	68
Tulsa	672	992.9	1017.8	54	31	42.5	1.7	68	3	12	30	0	19	29	64	3.13	1.44	1.25	6	2	8.8	8	12.3	SSE	52	NW	5	11	9	11	5.5	67
OREGON																																
Astoria	12	1016.6	1017.5	50	37	43.4	.7	56	4+	29	16	0	6	39	82	10.22	.38	2.23	22	1	.1	T	8.2	E	--	---	--	3	4	24	8.2	--
Burns CO	4140	876.4	1023.9	37	16	26.6	-1.1	50	5	-5	27	0	30	19	74	1.16	-.28	.64	9	0	12.8	7	----	---	--	---	--	10	4	17	6.2	--
Eugene	361	1006.4	1020.4	48	34	40.7	.1	56	4+	23	19	0	14	--	--	4.83	-1.17	1.02	20	1	.2	T	----	---	--	---	--	2	7	22	8.3	--
Meacham	4050	------	------	35	22	28.6	-.5	43	21	9	27	0	31	--	--	4.96	.66	2.23	12	0	43.4	24	----	---	--	---	--	7	1	23	7.5	--
Medford	1312	973.2	1021.9	46	30	30.2	-.3	61	5	16	27	0	20	33	86	2.25	-.88	.72	15	0	1.2	1	2.4	SSE	*35	S	5	4	4	23	8.0	--
Pendleton	1492	966.8	1022.0	42	27	34.7	-.6	57	5	19	18+	0	24	26	75	1.00	-.69	.47	7	0	T	T	6.3	SE	--	---	--	6	5	20	7.3	--
Portland	22	1014.2	1019.6	46	36	40.9	.1	54	30	26	2+	0	8	36	82	5.01	-1.16	.85	20	0	1.2	1	11.7	ESE	40	S	14	2	0	29	9.0	14
Roseburg	505	1002.0	1021.0	48	33	40.5	---	50	8	24	16	0	19	--	--	4.99	.06	1.72	16	0	.7	1	3.9	---	31	SW	23	0	4	27	8.9	22
Salem	195	1012.2	1019.6	47	34	40.1	-.9	55	17	22	19	0	15	37	88	6.26	-.86	1.05	20	0	.5	T	8.2	S	--	---	--	2	5	24	8.5	--
Sexton Summit CO	3836	------	------	40	32	36.0	-.7	61	20	19	27	0	20	--	--	4.39	-.31	1.57	18	0	18.9	9	----	---	--	---	--	5	7	19	7.5	--
PENNSYLVANIA																																
Allentown	376	1001.6	1016.2	40	24	31.7	.6	56	29+	13	22+	0	27	23	72	3.29	.27	1.38	8	0	.1	T	12.2	W	--	---	--	9	7	15	6.4	--
Harrisburg	335	1003.1	1017.0	40	27	33.4	-.5	57	28	14	21	0	22	22	64	2.94	.38	1.06	9	0	.4	T	8.9	W	31	NW	7	8	4	19	6.9	44
Philadelphia CO	26	------	------	43	31	37.2	-.2	62	28	16	21	0	15	--	--	2.83	.06	.81	8	0	.2	T	9.1	---	26	NE	14+	7	11	13	6.6	39
Philadelphia	13	1011.7	1015.7	43	29	36.0	.1	63	28	15	21	0	19	26	69	2.66	-.01	.96	9	0	T	T	11.6	WNW	*35	WNW	30	7	10	14	6.5	--
Pittsburgh CO	749	------	------	40	28	34.1	-1.1	62	27	15	21	0	19	--	--	2.74	.17	.77	15	--	3.1	--	----	---	--	---	--	--	--	--	---	16
Pittsburgh	1151	986.4	1017.3	37	24	30.4	-.5	56	28+	10	21	0	28	24	76	2.70	.19	.73	17	1	7.3	2	11.8	WSW	*34	SW	23	3	10	18	7.6	27
Reading CO	266	1003.9	1016.6	41	29	34.9	.1	60	28	14	21	0	20	--	--	2.73	-.07	1.17	8	1	.8	1	12.5	---	50	E	30	7	7	17	6.8	41
Scranton CO	746	985.5	1015.5	37	25	30.7	-.2	53	28+	12	22+	0	27	--	--	2.81	.55	.96	10	0	3.1	2	7.0	---	22	NW	24	6	4	21	7.5	32
Williamsport	527	996.5	------	38	25	31.2	.3	48	28	11	21	0	27	--	--	3.87	1.20	1.21	15	0	4.5	1	----	---	--	---	--	1	12	18	7.5	--
RHODE ISLAND																																
Block Island	110	1009.4	1013.8	42	30	36.1	1.0	56	30	18	7+	0	20	--	--	5.57	2.21	1.47	10	0	7.7	4	----	---	--	---	--	3	13	15	7.2	--
Providence	55	1007.5	1013.7	41	26	33.4	1.8	57	29	8	23	0	26	24	69	5.73	2.28	1.82	11	0	9.2	7	11.4	WNW	*38	SE	18	3	12	16	6.9	45
SOUTH CAROLINA																																
Charleston CO	9	------	------	58	42	49.8	-2.4	73	29	27	7	0	4	--	--	3.80	1.09	1.80	7	1	T	0	9.8	---	38	N	6	14	10	7	4.6	74
Charleston	41	1017.6	1019.2	60	36	48.2	-2.3	76	29	20	8	0	14	38	73	4.30	1.59	2.15	7	0	.0	0	10.5	WSW	--	---	--	13	8	10	5.1	--
Columbia	217	1010.5	1019.0	57	32	44.6	-2.4	77	29	17	8	0	19	34	73	1.94	-1.65	.89	8	0	.0	0	7.1	WSW	*30	NNE	6	12	7	12	4.9	71
Florence	146	1012.5	1018.0	57	33	45.1	-1.4	78	29	21	8+	0	17	--	--	1.84	-1.41	.80	6	1	T	T	----	---	--	---	--	15	7	9	4.6	--
Greenville	1018	980.0	1018.1	50	33	41.2	-2.9	65	29	20	21	0	15	30	67	3.62	-.89	1.48	10	0	T	0	8.6	NE	42	SW	29	9	10	12	5.9	62
Spartanburg	801	------	------	51	33	41.7	-2.2	67	29	21	7	0	17	--	--	3.03	-.96	1.48	10	0	T	0	----	---	*37	S	29	--	--	--	---	--
SOUTH DAKOTA																																
Huron	1282	969.2	1018.4	31	14	22.2	2.6	44	22	3	2+	0	31	19	86	.09	-.36	.05	4	0	1.3	4	9.9	SSE	35	NW	23	7	6	18	7.1	46
Rapid City	3165	900.8	1018.0	43	22	32.4	6.7	63	20	5	1	0	27	20	64	.25	-.09	.14	3	0	1.2	7	9.8	NNW	45	NW	17	9	9	13	5.7	57
Sioux Falls	1420	965.1	1018.5	31	15	22.9	3.5	40	22+	1	3	0	31	17	75	.09	-.58	.05	2	0	1.0	8	10.2	NW	*29	N	17+	6	6	19	6.9	--
TENNESSEE																																
Bristol	1519	962.4	------	45	27	36.3	-2.4	70	29	14	8	0	25	--	--	3.79	.36	1.27	13	0	1.6	1	----	---	--	---	--	8	3	20	7.2	--
Chattanooga	670	991.2	1019.4	50	31	40.2	-1.9	69	29	22	16	0	20	31	75	8.67	3.36	3.07	8	1	T	0	4.8	NW	*29	SW	29	5	6	20	7.1	47
Knoxville	950	983.1	1019.2	47	30	38.5	-2.5	71	29	21	8+	0	21	30	73	5.97	1.71	1.72	15	1	T	T	8.0	NE	52	SW	29	5	7	19	7.2	25
Memphis CO	271	------	------	52	36	44.1	-.3	66	5	25	20	0	7	--	--	3.45	-1.34	2.23	8	--	T	T	----	---	--	---	--	--	--	--	---	--
Memphis	263	1003.7	1018.6	54	33	43.1	-.2	68	23	22	20	0	18	32	68	3.46	-1.63	1.92	9	3	T	T	10.4	SSE	43	N	5	10	5	16	6.0	56
Nashville	577	998.6	1018.9	49	31	40.0	-1.6	67	29	22	25+	0	19	33	77	5.57	1.51	2.15	13	2	.3	T	7.8	SSE	34	N	5	7	7	17	6.7	41
Oak Ridge CO	905	984.1	------	47	29	37.7	-1.1	69	29	17	8	0	22	--	--	9.39	3.73	4.73	13	1	2.1	1	5.0	SW	30	SW	29	5	7	19	7.3	--

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)				
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M p. h.			0–3	4–7	8–10	0–10	%
TEXAS																																
Abilene	1759	956.3	1018.3	63	36	49.3	3.5	89	4	16	29	0	8	29	51	0.60	-0.77	0.58	2	2	4.0	4	14.0	S	43	S	10	14	6	11	5.0	77
Amarillo	3590	889.6	1017.6	57	28	42.3	5.0	78	4	6	29	0	21	15	38	.19	-.48	.07	4	0	1.6	1	15.5	N	57	SW	4	13	7	11	4.9	59
Austin	615	997.6	1019.6	69	44	56.5	4.3	84	4	27	30	0	1	39	57	.61	-2.10	.59	3	1	.0	0	10.4	NW	34	NW	29	14	5	12	4.8	61
Brownsville	16	1016.3	1018.8	76	54	65.1	2.7	85	5	39	18	0	0	53	70	.08	-2.08	.06	3	0	.0	0	10.6	SE	35	NW	28	13	7	11	4.7	70
Corpus Christi	40	1018.3	1019.2	73	51	62.0	4.0	87	4	33	18+	0	0	50	70	.24	-2.03	.12	6	0	.0	0	12.1	SSE	40	S	11	14	6	11	4.7	65
Dallas	487	1000.0	1019.2	62	38	50.0	1.7	78	4	28	13	0	7	35	62	.88	-1.74	.50	3	1	.4	T	10.2	NW	42	NW	5	15	4	12	4.8	62
Del Rio	1091	984.8	1019.6	69	42	55.4	2.2	83	4	27	29	0	3	32	45	T	-.88	T	0	0	.0	0	8.6	---	42	NW	28	16	9	6	3.7	70
El Paso	3920	889.6	1019.6	61	31	46.0	1.2	75	4	15	29	0	17	17	33	.02	-.47	.02	1	0	.6	1	10.9	NNE	43	NW	4	16	8	7	4.1	88
Fort Worth	544	998.3	1019.4	62	38	49.7	1.6	80	4	29	13	0	8	35	61	.78	-1.70	.45	3	1	T	T	13.8	S	*44	WNW	5	15	7	9	4.8	--
Galveston CO	7	------	------	66	53	59.2	2.2	76	1	37	29	0	0	--	--	1.33	-2.93	.62	7	--	T	T	12.5	---	50	NW	28	--	--	--	---	61
Galveston	5	1017.3	1019.6	65	52	58.7	2.2	74	1+	37	29	0	0	50	75	1.21	-3.61	.62	6	1	.0	0	12.5	SE	--	---	--	12	8	11	5.0	--
Houston CO	41	1013.9	------	68	49	58.8	3.0	81	4	36	29	0	0	--	--	2.31	-2.32	.95	7	2	.0	0	10.2	---	34	NW	5	11	7	13	5.5	68
Houston	50	1016.6	1019.6	69	46	57.4	2.2	82	4	32	29	0	1	45	68	1.42	-3.04	.53	5	0	.0	0	13.4	WNW	--	---	--	11	6	14	5.7	--
Laredo	500	1003.7	1018.8	74	50	62.1	2.8	88	4	33	29	0	0	43	55	.09	-1.35	.08	2	0	.0	0	8.8	SSE	*29	NNW	28	14	6	11	4.5	--
Lubbock	3243	904.8	1018.6	58	27	42.7	2.1	80	4	3	29	0	23	23	50	1.09	.43	.57	3	1	8.6	5	14.7	WSW	*48	W	4	15	7	9	4.6	--
Midland	2854	919.1	1018.7	63	33	48.2	2.8	85	4	17	29	0	17	22	41	.12	-.63	.10	2	1	1.2	1	8.7	SW	*32	N	16	12	10	9	4.7	--
Port Arthur	16	1018.3	1019.5	67	45	56.2	2.1	79	1	31	30	0	1	47	75	1.32	-4.15	.76	6	0	.0	0	12.6	ESE	39	NW	5	11	11	9	5.2	58
San Angelo	1903	950.9	1019.2	65	37	51.4	2.6	91	4	22	29	1	9	27	44	.05	-1.08	.05	1	0	T	T	11.4	W	*35	SW	16	14	10	7	4.5	--
San Antonio	792	993.9	1019.1	71	46	58.3	5.2	85	4	28	30	0	3	37	50	.20	-1.72	.16	4	0	.0	0	8.5	NNW	37	N	5	15	8	8	4.3	69
Victoria	110	1014.6	1019.4	71	49	59.6	2.8	83	1	33	30	0	0	46	63	1.39	-1.68	.53	7	1	.0	0	8.7	---	%42	NW	28	13	4	14	5.1	--
Waco	500	1000.3	1019.1	65	39	52.2	2.0	85	4	28	30	0	6	38	62	.07	-2.67	.06	2	0	T	0	13.7	S	--	---	--	11	8	12	5.3	--
Wichita Falls	1027	981.4	1018.3	59	34	46.2	2.4	88	4	14	29	0	13	29	54	2.20	.73	1.32	5	4	4.0	4	10.7	NW	*35	WNW	4	16	5	10	4.5	--
UTAH																																
Milford	5028	848.0	1025.5	41	15	28.0	.0	54	24	-5	28	0	31	--	--	.56	-.19	.35	4	0	2.1	5	----	---	--	---	--	12	9	10	5.0	--
Salt Lake City	4220	872.3	1025.5	39	21	30.3	-1.2	50	15	7	28	0	30	23	76	.69	-.65	.47	8	0	4.2	1	6.0	SSE	24	NE	9+	12	3	16	5.7	56
VERMONT																																
Burlington	331	998.8	1014.0	30	16	23.2	.4	46	28	1	23	0	30	19	80	3.49	1.61	.86	22	0	26.1	6	11.0	S	33	S	9	2	3	26	8.7	24
VIRGINIA																																
Lynchburg	947	983.8	------	45	29	37.1	-1.8	66	30	14	22+	0	23	--	--	3.04	-.11	.82	9	0	1.5	1	9.2	---	33	S	29	13	6	12	5.2	58
Norfolk	26	1017.2	1018.3	50	33	41.3	-1.5	69	30+	19	22+	0	15	31	68	3.62	.74	1.85	7	0	3.6	4	10.8	WNW	37	SW	30	12	6	13	5.3	60
Richmond	162	1012.0	1018.2	48	28	38.2	-1.3	69	30	11	22	0	23	28	70	2.43	-.46	.99	7	0	2.2	2	8.6	WSW	29	S	29+	12	8	11	5.2	57
Roanoke	1174	975.2	1018.3	45	29	37.0	-2.0	64	29+	14	8	0	22	26	66	3.95	.82	1.22	9	0	1.1	T	9.8	NW	--	---	--	10	6	15	5.9	--
WASHINGTON																																
Olympia	190	1010.5	1017.9	45	34	39.2	-.2	54	5	24	2	0	12	36	85	6.99	-1.67	1.04	19	0	1.4	1	7.8	SSW	*33	SW	5	2	2	27	9.0	--
Seattle CO	14	------	------	48	40	43.9	.8	57	5	31	19	0	2	--	--	4.46	-.88	1.29	15	0	T	0	11.1	---	54	S	23	4	2	25	8.4	23
Seattle	14	1017.0	1018.1	--	--	----	---	--	--	--	--	--	--	37	81	----	----	----	--	--	----	--	7.7	SSE	--	---	--	--	--	--	---	--
Seattle-Tacoma	379	1003.7	1018.1	46	36	40.8	1.0	55	5	27	16+	0	9	37	87	5.20	-.48	1.15	16	0	T	T	11.5	SSW	--	---	--	2	5	24	8.6	--
Spokane	2357	950.6	1021.6	36	25	30.2	1.1	47	6	1	27	0	31	25	82	1.44	-.77	.55	10	0	7.8	3	8.0	NE	34	S	30	4	7	20	7.4	39
Stampede Pass CO	3958	878.4	1020.5	29	22	25.6	-.6	41	21	15	27	0	31	--	--	11.76	-2.90	3.10	20	0	88.3	58	----	---	--	---	--	4	4	23	8.0	--
Tatoosh CO	101	1011.9	1015.2	48	41	44.8	.7	53	4+	33	25	0	0	40	83	11.64	-.40	1.93	25	2	2.3	T	20.4	E	64	S	23	3	3	25	8.4	23
Walla Walla CO	949	985.4	1022.4	42	30	36.1	-.2	60	5	18	18	0	21	--	--	1.65	-.16	1.08	9	0	T	T	5.5	---	26	SE	5+	4	5	22	7.8	19
Walla Walla	1200	------	------	--	--	----	---	--	--	--	--	--	--	28	--	----	----	----	--	--	----	--	5.5	S	--	---	--	--	--	--	---	--
Yakima	1061	981.7	1022.2	40	23	31.5	.9	55	31	11	27	0	31	26	83	.33	-.77	.20	5	0	3.2	3	4.5	WNW	--	---	--	7	7	17	6.8	--
WEST VIRGINIA																																
Charleston	950	981.7	1018.2	43	28	35.6	-2.5	67	27	11	8	0	25	26	71	3.18	.20	1.16	14	1	4.3	2	8.9	WSW	*40	WNW	9	4	7	20	7.6	--
Elkins	1970	------	------	39	21	29.9	-3.0	62	29	-2	21	0	11	23	--	2.85	-.28	.88	16	0	7.5	3	7.3	NW	*34	NW	9	5	2	24	8.1	--
Huntington	565	------	------	44	29	36.6	-2.5	69	27	14	8+	0	22	--	--	3.44	.27	1.16	15	--	4.5	3	----	---	--	---	--	--	--	--	---	--
Parkersburg CO	615	------	------	42	27	34.4	-1.7	65	27	11	22+	0	23	--	--	3.57	.67	1.54	13	1	4.6	2	6.2	---	31	W	9	5	7	19	7.4	23
Parkersburg	837	------	1018.0	--	--	----	---	--	--	--	--	--	--	26	--	----	----	----	--	--	----	--	7.1	WSW	--	---	-	--	--	--	---	--
WISCONSIN																																
Green Bay	689	994.2	1017.8	31	16	23.2	3.1	40	24	0	20	0	31	18	77	.42	-.84	.19	9	0	4.5	2	9.8	SW	37	SW	25	5	7	19	7.3	32
La Crosse	652	992.6	1018.2	31	18	24.4	3.9	40	23+	5	19	0	31	19	78	.47	-.75	.21	7	0	5.3	6	9.0	NNW	*30	NW	23	7	4	20	7.4	--
Madison	857	981.0	1017.7	32	16	23.9	.9	42	24	3	7	0	31	20	80	1.20	-.20	.41	13	0	13.1	7	8.4	NNW	31	W	23	4	8	19	7.5	40
Milwaukee	675	991.5	1017.5	34	23	28.0	2.3	42	25	10	11	0	29	23	78	2.64	1.16	.74	14	0	17.6	9	11.7	WNW	33	NE	29	3	6	22	7.8	37
WYOMING																																
Casper	5322	837.1	1019.5	38	21	29.8	4.3	49	3	5	27	0	29	14	54	.32	-.33	.21	6	0	5.5	3	18.7	SSW	--	- -	-	14	8	9	4.6	--
Cheyenne	6131	810.7	1019.2	43	22	32.5	3.8	60	20	-2	28	0	27	15	52	.20	-.32	.10	3	0	3.1	2	15.9	W	54	NW	18	16	7	8	4.3	61
Lander	5563	836.1	1023.0	38	13	25.7	5.3	55	18	-3	28	0	31	13	60	.03	-.46	.02	2	0	.8	3	5.6	---	38	SW	31	14	13	4	3.9	83
Sheridan	3942	884.5	1020.3	42	15	28.9	4.9	61	21	0	1+	0	31	--	--	.24	-.43	.17	3	0	3.4	2	7.3	WNW	52	NW	15	11	9	11	5.1	63
PACIFIC AREA																																
Canton Island	9	1008.1	1008.6	88	78	82.9	-.1	91	2+	75	3	8	0	71	71	.16	-.79	.15	2	0	.0	0	----	---	--	---	--	5	20	6	5.4	--
Hilo	31	1013.5	1015.0	76	63	69.5	-1.9	80	16+	58	19	0	0	64	85	50.82	34.83	10.10	28	2	.0	0	7.1	WSW	*32	N	16	16	3	5	8.2	29
Honolulu	7	1015.6	1016.0	79	67	73.0	-.7	83	15+	57	18	0	0	62	70	4.06	.06	1.54	15	1	.0	0	12.7	ENE	36	E	31	8	12	11	5.7	63
Koror CO	94	1004.4	1008.2	87	75	80.9	.1	90	1+	72	24	3	0	76	84	12.30	-1.23	2.41	27	5	.0	0	----	---	--	---	--	0	6	25	8.7	--
Lihue	115	1011.2	1016.2	78	66	71.9	.4	82	1	55	18	0	0	64	75	6.46	1.11	2.30	23	1	.0	0	15.4	NE	32	NE	6	3	15	13	6.5	39
Ponape CO	112	1002.4	1007.8	86	75	80.4	-.5	90	4	69	3	1	0	75	86	20.21	3.02	6.06	27	2	.0	0	----	---	--	---	--	0	7	24	8.5	--
Truk (Moen Island)	8	1007.8	1008.3	85	78	81.3	.2	87	10	74	2+	0	0	77	85	23.64	11.49	10.44	29	0	.0	0	----	---	--	---	--	1	4	26	8.9	--
Wake Island	11	1012.2	1012.5	83	74	78.4	-.6	85	8+	64	4	0	0	71	78	2.99	.92	1.83	9	2	.0	0	12.2	E	--	---	--	15	6	10	4.7	--
Yap CO	53	1006.4	1008.3	85	76	80.2	-1.0	87	1	73	26+	0	0	76	84	17.05	6.90	3.85	24	0	.0	0	----	--	--	---	--	4	6	21	8.1	--
WEST INDIES																																
San Juan, P.R. CO	47	------	------	82	72	77.0	.5	86	3	68	24	0	0	--	--	2.85	-1.98	.93	16	0	.0	0	----	---	--	---	--	--	--	--	---	--
San Juan, P.R.	9	1012.9	1015.0	83	71	76.7	.4	86	14+	67	24	0	0	68	77	2.86	-2.36	1.06	19	0	.0	0	10.2	ENE	30	E	28	7	23	1	4.7	82

Data from airport unless otherwise specified. CO indicates data from city office.
* Data entered in column "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.
+ And also on a later date or dates.
% Peak gust.
a Maximum hourly average

HEATING DEGREE DAYS

Table 3

(Base 65°F.)

DECEMBER 1954

State and station	Current season		Normals
	This month	Period July through this month	July through this month
ALABAMA			
Birmingham	652	1228	1130
Mobile	424	758	623
Montgomery	559	1026	864
ARIZONA			
Flagstaff	1094	2686	2967
Phoenix (CO)	316	357	555
Phoenix	336	389	645
Prescott	829	1473	1720
Tucson	364	468	649
Winslow	967	1704	1903
Yuma	263	278	364
ARKANSAS			
Ft. Smith	689	1232	1273
Little Rock	635	1139	1179
Texarkana	519	951	913
CALIFORNIA			
Bakersfield	574	925	819
Bishop	854	1636	1675
Blue Canyon	825	1987	2006
Burbank	302	468	580
Eureka (CO)	514	1936	2033
Fresno	650	1104	1011
Los Angeles (CO)	213	324	451
Los Angeles	228	416	697
Mt. Shasta (CO)	967	2450	2326
Oakland	509	1151	1238
Red Bluff	672	1115	942
Sacramento (CO)	644	1103	980
Sacramento	658	1181	1072
Sandberg (CO)	735	1391	1403
San Diego	207	306	496
San Francisco (CO)	462	1346	1247
San Francisco	529	1408	1360
San Jose	477	917	861
Santa Maria	398	1086	1113
COLORADO			
Alamosa	1417	3260	3621
Colorado Springs	959	2152	2391
Denver	934	2020	2364
Grand Junction	1195	2213	2293
Pueblo	905	1883	2279
CONNECTICUT			
Bridgeport	939	1863	2059
Hartford	1031	2182	2280
New Haven	963	2015	2163
DELAWARE			
Wilmington	920	1835	1841
DIST. OF COLUMBIA			
Washington (CO)	841	1634	1604
Washington	857	1661	1630
FLORIDA			
Apalachicola (CO)	366	593	475
Daytona Beach	301	479	288
Fort Myers	163	196	126
Jacksonville (CO)	337	573	416
Jacksonville	376	636	473
Key West (CO)	25	25	18
Miami (CO)	69	73	53
Int. Airport, Hialeah	82	82	60
Miami Beach	43	43	37
Orlando	254	373	222
Pensacola (CO)	379	653	529
Tallahassee	459	796	606
Tampa	233	342	223
West Palm Beach	117	125	69
GEORGIA			
Athens	655	1284	1109
Atlanta	652	1257	1125
Augusta	594	1156	835
Columbus	579	1102	951
Macon	532	1006	824
Rome	750	1484	1256
Savannah	511	946	675
IDAHO			
Boise	1062	2326	2340
Lewiston	984	2282	2247
Pocatello	1360	2901	2727
ILLINOIS			
Cairo (CO)	768	1447	1465
Chicago (CO)	982	1942	
Chicago	1020	2046	2352
Chicago University	1018	2054	
Moline	1108	2285	2434
Peoria	1046	2115	2323
Springfield	967	1993	2193
INDIANA			
Evansville	863	1737	1715
Ft. Wayne	1060	2212	2382
Indianapolis	1010	2065	2141
South Bend	1097	2295	2442
IOWA			
Burlington	1070	2175	2334
Des Moines	1094	2215	2472
Dubuque	1228	2601	2801
Sioux City	1144	2315	2733
KANSAS			
Concordia (CO)	910	1742	2048
Dodge City	853	1665	1951
Topeka (CO)	909	1664	1891
Topeka	928	1724	2027
Wichita	854	1547	1763
Goodland	1010	2183	2461
KENTUCKY			
Lexington	916	1842	1884
Louisville (CO)	839	1588	1645
Louisville	862	1714	1733
Pikeville (CO)	829	1617	
LOUISIANA			
Baton Rouge	374	669	615
Lake Charles	306	537	593
New Orleans (CO)	270	462	429
Int.Airport,Moisant	321	570	484
Shreveport	437	803	848
MAINE			
Caribou	1422	3697	3918
Greenville (CO)	1379	3410	
Portland	1160	2730	2847
MARYLAND			
Baltimore (CO)	845	1553	1537
Baltimore	924	1849	1818
Frederick	954	1985	1841
MASSACHUSETTS			
Blue Hill Obs.	1067	2332	
Boston	941	1919	2015
Nantucket	870	1848	2078
Pittsfield	1223	2849	2933
MICHIGAN			
Alpena (CO)	1233	2815	2962
Detroit	1088	2229	2333
Detroit (Willow Run)	1100	2265	2383
East Lansing (CO)	1139	2366	
Escanaba (CO)	1195	2907	3213
Grand Rapids (CO)	1077	2237	2382
Grand Rapids	1133	2443	2640
Marquette (CO)	1213	3050	3167
Muskegon	1099	2407	2593
S. Ste. Marie	1351	3383	3575
MINNESOTA			
Duluth (CO)	1378	3538	3690
Duluth	1411	3601	3842
Internat. Falls	1501	3885	4223
Minneapolis	1281	2765	3015
Rochester	1310	2910	3144
St. Cloud	1349	3195	3483
MISSISSIPPI			
Jackson	505	942	882
Meridian	564	1049	956
Vicksburg (CO)	437	796	775
MISSOURI			
Columbia	906	1769	1973
Kansas City	864	1596	1875
St. Joseph	964	1842	2048
St. Louis (CO)	850	1642	1703
St. Louis	869	1734	1805
Springfield	871	1688	1841
MONTANA			
Billings	944	2276	2767
Glasgow (CO)	1121	2707	3458
Great Falls	937	2486	2959
Havre (CO)	1018	2547	3298
Helena	1295	3135	3349
Kalispell	1132	3270	3334
Miles City	1095	2525	3068
Missoula	1220	3146	3270
NEBRASKA			
Grand Island	1008	2122	2459
Lincoln (CO)	974	1947	2250
Norfolk	1088	2278	2744
North Platte	1065	2379	2581
Omaha	1025	1995	2373
Scottsbluff	997	2314	2638
Valentine (CO)	1057	2398	2730
NEVADA			
Elko	1255	3005	2905
Ely	1208	2912	2930
Las Vegas	649	941	969
Reno	1007	2486	2426
Tonopah	1042	2100	2241
Winnemucca	1175	2825	2612
NEW HAMPSHIRE			
Concord	1192	2725	2907
Mt. Washington Obs.	1662	6066	
NEW JERSEY			
Atlantic City (CO)	857	1589	1597
Newark	916	1804	1912
Trenton (CO)	915	1815	1852
NEW MEXICO			
Albuquerque	889	1526	1757
Clayton	826	1724	1991
Roswell	737	1344	1415
NEW YORK			
Albany	1142	2446	2583
Binghamton	1226	2742	2851
Buffalo	1117	2336	2470
New York (CO)	898	1724	1771
La Guardia Field	878	1631	1732
Rochester	1152	2415	2516
Schenectady	1113	2332	
Syracuse	1152	2376	2369
NORTH CAROLINA			
Asheville (CO)	857	1818	1633
Asheville	896	1966	
Charlotte	713	1378	1274
Greensboro	830	1671	1513
Hatteras (CO)	566	893	788
Raleigh	767	1499	1304
Wilmington	618	1104	869
Winston-Salem	812	1616	1458
NORTH DAKOTA			
Bismarck	1237	3004	3524
Devils Lake (CO)	1356	3375	3903
Fargo	1399	3207	3604
Grand Forks	1467	3452	
Pembina	1429	3172	
Williston (CO)	1171	2910	3566
OHIO			
Akron	1099	2329	2298
Cincinnati (CO)	854	1655	1711
Cincinnati	955	1946	1999
Cleveland (CO)	957	1911	2011
Cleveland	1014	2055	2181
Columbus	1008	2059	2139
Dayton	1021	2079	2128
Sandusky (CO)	1002	2006	2116
Toledo	1072	2234	2376
Youngstown	1105	2349	2274
OKLAHOMA			
Oklahoma City	724	1269	1417
Tulsa	690	1192	1382
OREGON			
Astoria	659	2020	1961
Burns (CO)	1182	2852	2829
Eugene	746	1973	1939
Meacham	1122	3204	3105
Medford	826	1890	1849
Pendleton	932	2079	2095
Portland (CO)	691	1555	1627
Portland	741	1820	1817
Roseburg	750	1900	
Salem	767	1967	1815
Sexton Summit (CO)	892	2592	2373
PENNSYLVANIA			
Allentown	1023	2154	2205
Harrisburg	973	1964	1971
Philadelphia (CO)	857	1627	1624
Philadalphia	889	1715	1791
Pittsburgh (CO)	952	1891	1890
Pittsburgh	1066	2192	2268
Reading (CO)	924	1842	1871
Scranton (CO)	1054	2209	2272
Williamsport	1042	2184	2250
RHODE ISLAND			
Block Island	889	1793	1963
Providence	976	2055	2221
SOUTH CAROLINA			
Charleston (CO)	468	790	658
Charleston	522	947	778
Columbia	630	1205	978
Florence	615	1122	1015
Greenville	728	1404	1200
Spartanburg	715	1390	1211
SOUTH DAKOTA			
Huron	1321	2753	3029
Pierre	1189	2542	
Rapid City	1005	2343	2858
Sioux Falls	1299	2710	3062
TENNESSEE			
Bristol	883	1801	1688
Chattanooga	761	1495	1380
Knoxville	813	1592	1454
Memphis	670	1265	1248
Nashville	768	1496	1372
TEXAS			
Abilene	482	856	1048
Amarillo	698	1328	1730
Austin	270	462	646
Brownsville	87	104	218
Corpus Christi	152	217	365
Dallas	461	802	870
Del Rio	297	500	585
El Paso	580	934	1086
Ft. Worth	464	817	890
Galveston (CO)	192	291	402
Galveston	206	324	418
Houston (CO)	216	365	465
Houston	260	447	509
Laredo	151	205	306
Lubbock	683	1295	1444
TEXAS (cont'd.)			
Midland	517	941	
Port Arthur	287	512	587
San Angelo	422	783	854
San Antonio	235	406	600
Victoria	206	312	408
Waco	389	678	754
Wichita Falls	573	955	1181
UTAH			
Milford	1138	2420	2551
Salt Lake City	1070	2191	2279
VERMONT			
Burlington	1290	2824	2925
VIRGINIA			
Lynchburg	857	1752	1625
Norfolk	727	1318	1257
Richmond	826	1612	1532
Roanoke	865	1798	1632
WASHINGTON			
Olympia	793	2337	2254
Seattle (CO)	645	1706	1776
Seattle	744	2117	2163
Spokane	1072	2686	2750
Stampede Pass (CO)	1215	4113	3831
Tatoosh Island (CO)	621	2295	2480
Walla Walla (CO)	891	1833	1966
Yakima	1033	2463	2476
WEST VIRGINIA			
Charleston	905	1875	1720
Elkins	1078	2400	2295
Huntington (CO)	871	1739	1597
Parkersburg (CO)	943	1904	1824
WISCONSIN			
Green Bay	1288	2951	3125
La Crosse	1253	2685	2931
Madison (CO)	1211	2543	2747
Madison	1267	2661	2846
Milwaukee	1137	2381	2663
WYOMING			
Casper	1085	2520	3021
Cheyenne	1001	2429	2912
Lander	1214	2756	3339
Sheridan	1114	2576	3113
ALASKA			
Anchorage	1825	4686	4807
Annette	877	2836	3022
Barrow	2502	8029	8392
Bethel	2171	5679	5559
Cordova	1392	4171	4190
Fairbanks	2688	6429	6374
Juneau	1146	3684	3966
Kotzebue	2554	6967	6630
McGrath	2610	6477	6378
Nome	2179	6231	5967
Northway	2700	7006	6963
St. Paul	1228	4828	4556
Yakutat	1239	4000	4071

Data from airport unless otherwise specified.
CO indicates data from city office.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4

DECEMBER 1954

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Opelika (2 miles north of), Lee County, Ala.	5	1 p.m.	50	100	0	14	°$140,000		Tornado	Skipping path from 2 miles north of Opelika, Ala., to vicinity of Manchester, Ga. In Alabama, 11 houses destroyed and 64 damaged. A large chicken farm suffered $40,000 damage. 33 buildings other than dwellings damaged. Moved east northeastward.
Ohatchee to Piedmont, Calhoun County, Ala.	5	1:30 p.m.	23	100	0	26	°200,000		do	37 houses destroyed, 48 damaged. Successively hit Ohatchee, Wellington, Angel Station, Merrillton, and Piedmont. Heaviest damage at Wellington where about 20 houses destroyed, 8 damaged, and most injuries occurred. 15 other buildings destroyed and 28 damaged. Moved east northeastward.
Bartlett's Ferry to Manchester, Harris, Talbot, and Meriwether Counties, Ga.	5	1:30-3:30 p.m.	30	100-300	0	3	150,000	Small	Tornado and rain	Clearly defined path observed from airplane, apparently originating in Alabama near Opelika; total path length about 50 miles. 30 in Georgia. Moved across Bartlett's Ferry (1:30 p.m.), passing through rural areas near Mountain Hill community and along Mountain Creek through Blue Springs community, Pine Mountain Valley, and Manchester. Moderate to heavy spotted damages Bartlett's Ferry to Blue Springs, reaching Pine Mountain Valley at 2:45 p.m. and causing losses of about $25,000, involving 1 home demolished, several others heavily damaged, numerous trees and utility lines blown down with other miscellaneous damages; 1 person injured. Storm hit at 3:15 p.m. in southern Manchester, lifting over central business area, and striking again in northeastern part of city. More than 100 homes damaged, many severely, and several demolished; numerous other buildings and structures suffered moderate to heavy damages; additional damage through broken roofs to furnishings from heavy rains. Total losses at Manchester, $100,000; 2 persons injured. Moved east northeastward.
Blakely to Bancroft, Early County, Ga.	5	1:30-2 p.m.	7	100-400	0	0	12,000	$2,000	Tornado	Grazed northern end of Blakely, cutting path through swamp to Bancroft where heaviest losses occurred; 6 houses and a church badly damaged or destroyed; truck crumpled up; stored crops blown away; some disruption of utility services; many trees blown down. Moved east northeastward.
Clayton (northeast of), Barbour County, Ala.	5	1:45 p.m.	70	100	0	3	°3,000		do	Began between Clayton and Batesville, Ala., and followed skipping path to near Ellaville, Ga. Moved east northeastward.
Phenix City (15 miles west of), Russell County, Ala.	5	Afternoon			0		9,000	0	Tornado (probable)	15 miles west of Phenix City, 3 houses destroyed (all close together) and power line downed. Reported by pilot patrolling power lines.
Shady Grove Community, Stewart County, to Ellaville, Schley County, Ga.	5	3:30-4:15 p.m.	30-35	100	1	32	170,000	10,000	Tornado	Probably originated northwest of Eufaula in Alabama, with moderate to heavy crop and timber losses throughout path in Georgia. Shady Grove (near Lumpkin, 3:30 p.m.): 1 injured, firewatch tower blown down, several homes and smaller buildings damaged. Pleasant Valley (midway between Lumpkin and Richland, 3:35 p.m.): losses, $15,000, 1 killed, 3 injured; home, church, and several smaller buildings destroyed, with other damages including trees and utility lines blown down and some crops in storage lost. Red Hill (3 miles north of Richland, 3:40 p.m.): losses $35,000, 16 injured; 2 homes and few smaller buildings demolished, several others severely damaged including 4 automobiles, a tractor, a trailer; considerable crops in storage blown away; funnel cloud observed and roaring sound like several jet planes in motion heard. Church Hill community (NE Webster County, 4 p.m.): losses, $10,000, 8 injured; 1 home demolished, several others heavily damaged, including a church. Draneville, Ebenezer community (4 miles southwest of Ellaville, 4:05 p.m.): losses, $15,000, 2 injured; 5 homes badly damaged or demolished, several others damaged; trees and wires blown down. Ellaville (Schley County, 4:10 p.m.): storm struck southern part and near business section, causing losses of $75,000 and 2 injuries; several homes and other structures demolished and others heavily damaged, including airplane and hangar; trees and utility lines blown down; number of pecan trees uprooted or blown down and other crop losses. Moved east northeastward.

See footnotes at end of table.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Buena Vista, Marion County, Ga.	5	4-4:30 p.m.	7	150	0	2	$34,800	$3,000	Tornado	Mostly in rural areas, moving through Buena Vista where 1 home destroyed and 3 heavily damaged, with moderate to heavy damage to several other buildings and structures; much feedstuff blown away; timber losses heavy, amounting to about $15,000. Moved east northeastward.
Talbotton (5 miles east-northeast of; Red Bone Community), Talbot County, Ga.	5	4-4:10 p.m.	4	60-100	0	7	4,500	500	do	Moved through Philadelphia Church area near Red Bone Community, where 2 small homes demolished, several others damaged, and a few smaller buildings destroyed or badly damaged; some corn, hay, and fodder in storage lost. Moved eastward.
Douglas County, Ga.	5	4-5 p.m.			0	0			Tornado (probable)	Data from RED CROSS indicated 4 homes and 3 other buildings damaged.
Taylorsville to Stilesboro, Bartow County, Ga.	5	4-4:30 p.m.	8	100-800	0	0	45,000	5,000	Tornado	Same line of tornadic action originating west of Wellington, Ala., extending in Georgia from a little west of Taylorsville to 1 mile east of Stilesboro. Demolished 3 warehouses, 2 homes and 6 barns; blew down power substation and high line steel tower, with heavy damages to several homes and other structures; numerous trees and utility lines blown down; heavy damage to a peach orchard. Moved east northeastward
Ansley, Pike County, Ala.	5	4 p.m.	1½	70	0	2	°5,000		do	Unoccupied house destroyed and 3 others damaged. 2 other buildings including a barn and much hay destroyed, and 4 other buildings damaged. Moved east northeastward.
Liberty City, Macon County, Ala.	5	4:30 p.m.				3	°5,000		Wind	5 houses damaged; tree limbs blown off.
Carrollton (6 miles NE), Sandy Hill, and Hulett, Carroll County, Ga.	5	4:30-5 p.m.	3-5	200	0	0	25,000	Small	Tornado	Part of tornadic action line extending to Atlanta, Ga., possibly originating in Alabama. Began just west of Sandy Hill, where 2 garages and numerous farm buildings demolished, with moderate to heavy damages to several homes and extensive roof damage. Ended 3 miles north of Hulett Community, where church destroyed and heavy damage to home and several smaller buildings. Moved east northeastward.
Dawson (4 miles north of; Yeomans Community), Terrell County, Ga.	5	5:10 p.m.	2-3	50-300	0	0	20,000	1,000	do	Affected trading center and 3 farms, demolishing home and several smaller buildings with heavy damage to numerous small buildings and other property; community store badly damaged. Many trees and some utility lines blown down. Considerable crops in storage blown away. Moved east northeastward.
Atlanta, Ga.	5	5:15 p.m.	½	50	0	0	25,000	0	do	In line of tornadic action passing earlier through Carroll County. Dipped into ravine just north of Fort McPherson; 1 home demolished, 6 others heavily damaged; 2 automobiles and several carports damaged by falling trees; power and telephone lines blown down, disrupting services over wide area and 5,000 phones out of service; number of trees blown down, some snapped off 10 feet above ground. Moved east northeastward.
Lucille Community, Early County, Ga.	5	5:30-6 p.m.	1-3	100	0	0	5,000	500	do	Path mostly through open country; demolished 3 homes and a barn in Lucille community, several other buildings damaged, and some stored crops blown away. Moved east northeastward.
St. Paul Island, Alaska	5-6	Late p.m., 5th-early a.m., 6th					2,000		Wind	An intense Low with associated occluded front, moved east-northeastward over southern Bering Sea. At 2:12 a.m., December 6, peak gust of wind of 90 m.p.h. from west observed at Weather Station, 4 miles northeast of the village. Part of south wall of village schoolhouse blown out and internal damage occurred. Moved east northeastward.
James River area, Va.	6	Early a.m.			2	1			Wind, rain, snow, and cold	2 members of fishing party, lost in darkness during strong winds and rain that later turned to snow, died of exposure before rescuers could reach them at foot of 60-foot cliff, 4 miles north of Smithfield. Third member hospitalized after exposure from below-freezing temperatures.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
North Dakota, northwestern portion	6		100	*50	1		$25,000		Wind, sleet, and frost	1 pilot killed indirectly by flying over wires, trying to knock frost off wires with backwash from propeller. Strong wind broke about 40 telephone poles in Berthold vicinity. Poles also reported downed between Dickinson and Bismarck.
Iowa	8	All day			3				Snow	Boy killed when school bus slid into him on slippery road. 2 killed when semitrailer truck jackknifed and struck car on icy road.
Allentown, Pa.	9	Daytime			2				do	Auto skidded on icy highway near here.
Pottsville, Pa.	10	Daytime				3			do	Auto skidded on icy street.
Kamuela (Hawaii) and vicinity	11								Rain	Highways and ranch lands damaged.
Colorado, eastern portion	16,17 and 18		300	*150			10,000	$1,000,000	Wind and blowing soil	Strong winds and blowing soil over most of State east of 105th Meridian caused severe erosion and damage to winter grains, ranges, pastures, and to some automobiles, small buildings, and other property.
Somerset County, Pa.	17	Night			1				Snow	1 person injured fatally on Pennsylvania Turnpike near Somerset, Pa., when car skidded out of control on icy roadway.
Selinsgrove, Pa.	18	Early morning				2			do	2 persons injured in collision on icy highway just west of Selinsgrove.
New England	21-22	24 hours of 21st and early a.m., of 22nd			11			0	do	3 to 22 inches of snow fell over New England with maximum depths in excess of 8 inches over southeastern New Hampshire, eastern Massachusetts, and Rhode Island; Portsmouth, N.H., recorded 22 inches. Northwesterly winds prevailed during entire period of storm. Deaths due to highway accidents (3) and overexertions (8). Falling temperatures following storm iced up many highways, causing numerous minor accidents, but few serious ones. Thousands of regular and emergency public works crews were clearing snow and sanding icy highways throughout night. Snow removal in Boston alone cost $200,000.
Iowa, most of State	27-28	All day				6			do	More than 100 cars damaged in collisions in Des Moines alone, and 6 persons injured.
Kansas, extreme southeastern and east-central portions	28-29								do	Heavy snow which began late evening of 28th and continued till noon 29th left 10 to 26 inches of snow from Franklin and Miami Counties southward. Fall of 26 inches in 14 hours at Fort Scott is greatest 24-hour snowfall of record in Kansas. Highway traffic completely paralyzed until roads could be cleared.
Laurel, Jones County, Miss.	28	6 p.m.	10	250	0	25	750,000	Minor	Tornado	Swept across 20 blocks of northwestern portion of Laurel, destroying 20 homes and damaging 87, and destroying 2 other buildings and damaging 6; trees uprooted, telephone and power lines downed. Moved northeastward.
Smith County, Miss.	28	6 p.m.			0	0	10,000	0	do	Little data available, except 1 home destroyed and 5 damaged. Moved northeastward.
Kemper and Noxubee Counties (near Gholson), Miss.	29	1 a.m.	10	300	0	10	50,000	Slight	do	Developed in general situation in which Jones and Smith County tornadoes developed but appears to be separate tornado; destroyed 3 and damaged 4 homes; destroyed 8 and damaged 21 outbuildings, barns etc. Moved northeastward.
Coffeeville to Oxford, Yalobusha and Lafayette Counties, Miss.	29	1:45-2:10 a.m.			1		60,000	Slight	Hail	Extended 28 miles from Coffeeville to Oxford in north-south direction, but extent of east-west axis not determined; could not have moved from Coffeeville to Oxford in time given, so must have been moving in an eastward direction, but developed and dissipated in general area. Damage to roofs and windows heavy in 2 towns; 68 windows in 1 school broken; townspeople reported terrible roar during downpour of hail with some high winds, but no evidence of surface tornado. Hailstones reported marble to egg size, some with horn-like projections. Man died in Coffeeville from heart attack during storm.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons: Killed	Number of persons: Injured	Estimated damage: Property (exclusive of crops)	Estimated damage: Crops	Character of storm	Remarks
Wisconsin, southeastern portion	29	A.m. & p.m.			9				Snow	Snowfall ranging up to 12½ inches. Strong winds, gusting up to 35 m.p.h., caused considerable drifting of snow. 9 deaths resulted from over exertion in shoveling snow or walking and driving in it. At Racine, 2 persons died from pushing stalled cars, and 1 from walking in snow. At Milwaukee 1 person died after pushing his car, and another while walking home from bus. At Kenosha 1 man died after shoveling snow.
Iowa, southeastern portion	29	All day			1	Many			do	Snowfall in Clinton area over 11 inches. 1 death resulted from over exertion while shoveling snow. Most airline schedules canceled. Numerous traffic injuries.
Fort Payne (7 miles north of), DeKalb County, Ala.	29	9:30 a.m.	3½	400		2	$36,000	$4,000	Wind	7 miles north of Fort Payne, 20 homes damaged; 10 other buildings destroyed, and 35 damaged. Moved northeastward.
Illinois, northeastern third	29	Afternoon and evening			Few				Snow and sleet	Snow and sleet caused many automobile accidents from which a few deaths resulted.
Mercer and Boyle Counties, Ky.	29	1:30-2:30 p.m.					10,000	3,000	Wind	Wind damaged and destroyed farm buildings, damaged a home, uprooted trees, and disrupted telephone and electric services. Hay and grain lost in damaged barns.
Kamuela, (Hawaii) and vicinity	29-31								do	Utility service poles and trees damaged.
Livingston, Iroquois, McLean, Ford, Logan, De-Witt, Piatt, Champaign, and Vermilion Counties, Ill.	29	Evening					50,000		Ice (glaze)	Many communities without phone and electric services due to heavy ice deposits on lines.

* Miles instead of yards.
° Crop damage included with other property damage.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

DECEMBER 1954

There was no significant flooding during December. Record low December stages were reached at several points in the East Gulf of Mexico drainage and the Arkansas Basin. In the West Gulf of Mexico drainage the Calcasieu reached a new record low stage at Lake Charles, La.

ST. LAWRENCE DRAINAGE

Precipitation (1.5 inches) during the last 4 days of December caused light flooding on the Genesee River at Scio, N. Y., on the 29th. No damage was reported from the light overflow.

ATLANTIC SLOPE DRAINAGE

Light flooding occurred in the lower reaches of the James River on December 31 and January 1 from the heavy rain on the 28th and 29th. The storm that caused this flood lasted 36 hours. Precipitation during that period totaled 2 to nearly 3 inches in the northern tributary basins above Columbia, Va., and from ½ to nearly 2 inches in the southern tributaries.

This same storm caused near bankfull stages in the North Branch of the Potomac at Cumberland, Md., and on the South Branch at Springfield, W. Va., on the 30th, and on the lower Potomac at the Leiter gage (9.6 feet - flood stage 10 feet) near Washington, D. C., on January 1.

No damage was reported from this rise.

EAST GULF OF MEXICO DRAINAGE

The Cahaba River reached a new December low stage of 1.40 feet at Marion Junction, Ala., on the 8th. The previous lowest December stage was 1.80 feet on December 2 and 3, 1953.

December was the 12th consecutive month with precipitation below normal at Montgomery, Ala. The previous record of total consecutive months with precipitation below normal was 11, October 1950 to August 1951, inclusive, with a deficiency of 20.81 inches, or only 59% of normal. Total precipitation during 1954 was 26.82 inches, a deficiency of 26.84 inches, or only 50% of normal. This is the worst drought of record, the year 1954 being the driest year in 83 years of record, 1872-1954 at Montgomery. The previous driest year was 1931 with an annual total of 34.44 inches. Incomplete reports indicate that 1954 will be the driest year of record in Alabama. The previous driest year in that state was 1904 with an annual rainfall of 39.48 inches.

Heavy rain (2 to 4 inches) on the 28th and 29th caused a sharp rise on the Pearl River to slightly above flood stage at Bogalusa, La., on January 1, 1955. Moderate rises occurred over the Leaf, Chickasawhay and Pascagoula Rivers, but no overflows were reported.

MISSISSIPPI SYSTEM

Upper Mississippi Basin.--The Upper Mississippi Navigation season closed at St. Paul, Minn., on November 30.

Snow cover over the Upper Mississippi above St. Paul on December 31 was generally 1 inch. The heaviest snow (7+ inches) was over Minnesota Arrowhead. In extreme eastern Minnesota along the St. Croix River, snow cover was nearly 4 inches.

Missouri Basin.--The Missouri River froze at Bismarck, N. Dak., on December 28, the latest freeze-up at this point in the period of record.

Ohio Basin.--The light flooding in the Ohio Basin between the 28th and 31st was due to heavy rain between the 26th and 29th.

In the upper Ohio Basin the storm lasted a period of 36 hours, beginning on the 28th and ending on the 29th. The average rainfall over the various areas was as follows: 1 to 1½ inches over the Allegheny River Basin with a snow cover varying from 1 to 12 inches and heavier amounts in the Sherman, N. Y., and Bradford, Pa., areas; 1½ to 2 inches over the Monongahela with a snow cover varying from a trace to 7 inches and heavier amounts in the Thomas, W. Va., area of the Monongahela River Basin, and with no snow on ground reported from the upper Ohio River Basin below Pittsburgh. Precipitation in the Wabash River Basin averaged about 1-1/4 inches. In the Tennessee River Basin the precipitation was considerably heavier, with a large area reporting storm-total amounts between 4 and 7 inches.

No damage was reported from the flooding.

Arkansas Basin.--The Arkansas River reached a new record mean monthly low stage of 2.5 feet for December at Tulsa, Okla. The previous low mean monthly stage was 2.9 feet in December 1939. At Van Buren, Ark., the mean monthly stage was 2.9 feet, or 4.0 feet below normal, the second lowest stage of record. The previous lowest stage of record was 2.5 feet in December 1939.

At Perkins, Okla., on the Cimarron River, the mean monthly stage was 2.4 feet or 2.1 feet below normal. This is also the lowest December stage of record. The previous low of 3.1 feet was recorded in December 1952. The low for December 1954 also equalled the previous low mean monthly stage for all months.

WEST GULF OF MEXICO DRAINAGE

The Calcasieu reached a new record low stage of -1.2 feet at Lake Charles, La., on the 19th due to strong north winds. The previous record low stage was -0.62 foot on March 3, 1943.

PACIFIC SLOPE DRAINAGE

Light overflow occurred twice during the first half of the month in the Sacramento River flood control system in California at the Tisdale Weir into the Sutter Bypass and once at the Colusa Weir. This overflow was due to precipitation that resulted from a rapid succession of storm fronts moving across northern California during the first 2 weeks of the month.

The minor flooding in the Columbia Basin towards the end of the month was due to moderately heavy rainfall in the foothills area and snow melt at the intermediate elevations on the western slope of the Cascades and in the Coast Range (elevations estimated between 800 and 2,500 feet).

No damage was reported from the flooding.

FLOOD STAGE DATA

(All dates in December unless otherwise specified)

River and station	Flood stage	Above flood stages -dates		Crest *	
		From—	To—	Stage	Date
	Ft.			Ft.	
ST. LAWRENCE DRAINAGE Lake Ontario					
Genesee: Scio, N. Y.	6	29	29	6.2	29
ATLANTIC SLOPE DRAINAGE					
James:					
Columbia, Va.	18	31	31	18.1	31
State Farm, Va.	12	Jan. 1	Jan. 1	12.5	Jan. 1
EAST GULF OF MEXICO DRAINAGE					
Pearl: Bogalusa, La.	15	Jan. 1	Jan. 1	16.2	Jan. 1
MISSISSIPPI SYSTEM Ohio Basin					
Cheat: Parsons, W. Va.	11	29	30	12.8	30
Monongahela:					
Lock 5, Brownsville, Pa.	23	30	31	24.4	30
Lock 4, Charleroi, Pa.	24	30	31	27.6	30
Lock 3, Elizabeth, Pa.	23	30	31	23.5	30
Lock 2, Braddock, Pa.	26	30	31	27.5	30
McKeesport, Pa.	12	30	31	13.9	30
Wabash:					
La Fayette, Ind.	11	31	Cont.	**11.4	31
Wabash, Ind.	12	30	30	**12.6	30
Cumberland: Williamsburg, Ky.	21	30	31	22.4	30-31
MISSISSIPPI SYSTEM (Cont'd.) Ohio Basin (Cont'd.)					
Elk:					
Fayetteville (Abv.), Tenn.	18	29	31	20.25	29
Fayetteville, Tenn.	659	29	31	663.3	29
South Chickamauga Creek:					
Chickamauga, Tenn.	10	29	31	12.2	30
Duck:					
Shelbyville (nr.), Tenn.	21	29	30	21.9	29
Shelbyville, Tenn.	719	29	30	720.5	29
Ohio: Dam 7, Midland, Pa.	30	31	31	31.9	31
PACIFIC SLOPE DRAINAGE					
Sacramento:					
Colusa Weir, Calif.	61.8	10	11	62.1	11
Tisdale Weir, Calif.	45.5	7 11	8 12	46.7 46.9	8 11
Columbia Basin					
Santiam: Jefferson, Ore.	13	31	Jan. 1	17.4	31
Tualatin: Dilley, Ore.	12	31	Jan. 1	12.4	31

* Provisional
** Highest stage reported but not necessarily the crest

RADIOSONDE DATA

Average monthly values

Table 20

DECEMBER 1954

Standard pressure surface (mb.)	ALBUQUERQUE, N. MEX. (841 MB.)				ATLANTA, GA. (984 MB.)				BISMARCK, N. DAK. (957 MB.)				BOISE, IDAHO (923 MB.)				BROWNSVILLE, TEX. (1019 MB.)				BUFFALO, N. Y. (993 MB.)				BURRWOOD, LA. (1019 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,619	3.2	42	31	309	5.8	72	31	505	-5.0	76	31	868	-1.9	73	31	7	16.9	77	29	182	-2.0	84	29	3	14.5	70
1000	31	186			31	172			31	151			31	218			31	166	19.0	64	29	127	-1.5		29	164	14.5	67
950	31	614			31	598	6.3	61	31	562	-4.5	73	31	631			31	609	16.6	57	29	538	-3.3	74	29	601	11.8	60
900	31	1,063			31	1,037	5.2	57	31	989	-1.3	61	31	1,065	.2	59	31	1,064	14.2	49	29	961	-5.2	73	29	1,047	10.0	51
850	31	1,530			31	1,503	4.4	52	31	1,444	-1.3	51	31	1,523	-.8	55	31	1,545	12.5	41	29	1,408	-6.9	70	29	1,521	9.0	40
800	31	2,024	3.7	34	31	1,995	3.1	45	31	1,926	-2.7	43	31	2,006	-2.0	51	31	2,051	10.7	39	29	1,880	-8.3	63	29	2,022	7.5	36
750	31	2,550	1.5	31	31	2,522	1.0	41	31	2,442	-5.4	42	31	2,522	-3.5	53	31	2,595	9.1	27	29	2,384	-10.2	62	29	2,559	5.1	35
700	31	3,098	-1.4	31	31	3,067	-1.8	41	31	2,973	-8.3	39	31	3,060	-6.5	54	31	3,156	6.1		29	2,908	-13.1	61	29	3,112	2.4	34
650	31	3,685	-4.9	32	31	3,658	-5.1	43	31	3,554	-11.5	35	31	3,641	-9.9	51	31	3,760	2.5		29	3,477	-16.3	55	29	3,705	-.9	30
600	31	4,310	-8.3		31	4,278	-8.9	42	31	4,154	-15.5	37	31	4,248	-13.5	47	31	4,401	-1.4		29	4,068	-19.6	51	29	4,343	-4.3	
550	31	4,981	-12.2		31	4,949	-13.0	41	31	4,811	-19.9	39	31	4,909	-17.5	44	31	5,085	-5.8		29	4,711	-23.3	50	29	5,026	-8.4	33
500	31	5,703	-16.9		31	5,666	-17.8	37	31	5,505	-24.3	38	31	5,613	-21.9		31	5,829	-10.9		29	5,401	-27.4	47	29	5,757	-12.9	31
450	31	6,490	-22.6		31	6,454	-23.4	36	31	6,274	-29.8	42	31	6,385	-27.3	40	31	6,637	-16.5		29	6,157	-32.4	49	29	6,559	-18.7	32
400	31	7,338	-28.7		30	7,295	-29.6	38	31	7,094	-35.8	46	31	7,218	-33.2	39	30	7,507	-22.7		28	6,967	-37.9		29	7,419	-25.4	
350	31	8,279	-36.0		30	8,234	-36.4		31	8,008	-42.8		31	8,143	-39.9		30	8,472	-30.2		27	7,865	-43.0		29	8,374	-32.5	
300	30	9,341	-43.4		29	9,283	-43.8		31	9,031	-49.9		30	9,179	-47.3		30	9,550	-38.6		27	8,892	-47.6		29	9,441	-40.9	
250	29	10,543	-51.4		29	10,488	-50.9		31	10,207	-55.2		29	10,361	-53.9		30	10,776	-48.5		27	10,087	-50.3		28	10,656	-50.1	
200	29	11,967	-58.0		29	11,923	-55.9		31	11,631	-53.7		29	11,780	-56.7		30	12,209	-58.4		27	11,539	-51.4		28	12,085	-58.1	
175	29	12,805	-58.9		29	12,772	-56.4		31	12,490	-53.0		28	12,632	-55.5		30	13,043	-61.3		25	12,409	-51.4		27	12,920	-60.5	
150	28	13,767	-59.9		29	13,748	-58.1		30	13,487	-52.8		27	13,613	-55.3		29	13,993	-64.1		22	13,428	-52.1		27	13,874	-62.8	
125	28	14,900	-61.8		27	14,889	-61.1		30	14,658	-54.2		26	14,771	-56.7		28	15,101	-67.7		16	14,610	-53.0		25	14,986	-65.7	
100	28	16,276	-63.2		24	16,260	-63.2		27	16,079	-54.3		24	16,186	-57.9		28	16,431	-71.0		14	16,038	-54.7		23	16,331	-68.4	
80	24	17,645	-63.5		18	17,624	-62.2		25	17,519	-54.3		20	17,623	-57.2		21	17,750	-72.4		10	17,468	-55.1		18	17,671	-68.3	
60	20	19,423	-61.7		9	19,396	-61.5		25	19,359	-54.6		20	19,444	-56.3		15	19,460	-67.3		8	19,296	-55.6		14	19,392	-65.9	
50	12	20,556	-61.2		6	20,530	-60.6		22	20,527	-55.0		20	20,604	-55.6		13	20,566	-64.3		5	20,462	-57.0		13	20,498	-63.9	
40	6	21,963	-60.1		6	21,920	-60.3		15	21,974	-55.7		13	22,054	-56.4		10	21,938	-61.7						11	21,873	-61.9	
30									9	23,824	-55.8		6	23,854	-56.1		6	23,715	-59.3						5	23,629	-59.8	

	CARIBOU, ME. (988 MB.)				CHARLESTON, S. C. (1018 MB.)				COLUMBIA, MO. (989 MB.)				DODGE CITY, KANS. (926 MB.)				EL PASO, TEX. (885 MB.)				ELY, NEV. (812 MB.)				GLASGOW, MONT. (939 MB.)			
SURFACE	31	191	-6.8	80	31	13	7.2	80	31	238	2.1	69	31	792	1.8	52	31	1,195	8.6	31	31	1,908	-4.2	65	31	648	-2.7	66
1000	31	92			31	160	10.2	65	31	146			31	158			31	164			31	218			31	142		
950	31	496	-7.0	77	31	591	8.6	56	31	565	2.4	60	31	582			31	607			31	644			31	559		
900	31	914	-7.7	71	31	1,032	6.8	53	31	998	1.9	58	31	1,021	5.4	39	31	1,060			31	1,081			31	990	1.7	45
850	31	1,357	-8.6	67	31	1,499	4.7	50	31	1,458	.9	51	31	1,487	4.8	34	31	1,530	10.0	23	31	1,538			31	1,450	.4	40
800	31	1,827	-9.2	62	31	1,992	3.5	40	31	1,943	-.6	50	31	1,980	3.1	34	31	2,031	7.3	24	31	2,023	-.9	57	31	1,933	-2.3	42
750	31	2,331	-10.5	58	31	2,525	1.8	38	31	2,465	-2.7	48	31	2,508	.6	31	31	2,568	4.6	26	31	2,543	-1.7	47	31	2,446	-5.2	43
700	31	2,854	-12.5	57	31	3,067	-1.1	36	31	3,002	-5.3	42	31	3,053	-2.4	30	31	3,117	1.3		31	3,085	-4.0	42	31	2,982	-8.1	43
650	31	3,422	-15.4	53	31	3,661	-4.5	36	31	3,587	-8.4	41	31	3,644	-5.8	31	31	3,718	-2.0		31	3,671	-6.5	37	31	3,559	-11.5	39
600	31	4,017	-18.9	51	31	4,281	-8.0	35	31	4,197	-11.9	35	31	4,261	-9.5		31	4,341	-5.8		31	4,289	-9.8	34	31	4,163	-15.3	37
550	31	4,661	-22.6	49	31	4,955	-12.0	33	31	4,862	-16.2	38	31	4,933	-13.9		31	5,022	-10.3		31	4,957	-14.0		31	4,819	-19.8	36
500	31	5,352	-27.3	48	31	5,674	-16.6	34	31	5,568	-21.1	38	31	5,644	-18.8	29	31	5,743	-15.4		30	5,674	-18.9		31	5,515	-24.6	36
450	31	6,105	-32.6	47	31	6,466	-22.1		31	6,349	-26.3		31	6,428	-24.5		31	6,540	-21.1		30	6,453	-24.5		31	6,282	-30.4	34
400	31	6,921	-38.4		31	7,312	-28.6		31	7,179	-32.4		31	7,269	-30.6		31	7,389	-27.4		30	7,298	-30.5		31	7,100	-36.5	
350	31	7,826	-43.9		31	8,253	-35.6		31	8,107	-39.1		31	8,203	-37.5		31	8,334	-34.9		28	8,232	-37.7		29	8,028	-43.0	
300	31	8,850	-48.1		31	9,307	-43.5		31	9,147	-45.9		31	9,250	-44.5		30	9,392	-43.1		27	9,292	-45.6		28	9,050	-50.1	
250	31	10,042	-50.8		31	10,509	-50.9		31	10,341	-52.5		30	10,446	-51.7		30	10,595	-51.7		25	10,488	-53.6		26	10,223	-54.7	
200	31	11,490	-51.4		30	11,933	-55.8		31	11,768	-55.7		30	11,874	-56.2		28	12,024	-59.0		25	11,902	-58.6		26	11,647	-54.0	
175	31	12,358	-51.0		30	12,779	-57.3		27	12,613	-54.8		30	12,722	-56.6		28	12,856	-61.0		25	12,742	-57.8		26	12,505	-53.4	
150	31	13,359	-51.3		30	13,748	-59.1		25	13,593	-55.7		30	13,697	-57.2		28	13,809	-62.7		25	13,714	-58.1		26	13,496	-53.4	
125	31	14,541	-52.0		30	14,883	-61.4		24	14,751	-57.2		30	14,846	-58.5		25	14,920	-64.6		24	14,857	-59.7		26	14,668	-53.8	
100	28	15,969	-53.6		27	16,261	-64.2		23	16,153	-59.3		27	16,239	-60.5		25	16,275	-66.5		24	16,247	-60.4		25	16,087	-54.2	
80	27	17,395	-54.9		25	17,617	-64.5		21	17,547	-59.7		25	17,624	-61.2		23	17,614	-67.2		21	17,641	-61.2		25	17,519	-53.8	
60	24	19,221	-56.3		23	19,377	-62.9		15	19,351	-59.1		14	19,439	-59.9		19	19,360	-64.3		17	19,440	-58.9		23	19,356	-53.6	
50	18	20,379	-56.0		19	20,499	-61.7		15	20,492	-59.3		14	20,576	-59.9		15	20,489	-62.5		17	20,584	-58.6		20	20,527	-53.7	
40	12	21,813	-56.3		13	21,892	-60.0		13	21,888	-59.4		8	21,955	-59.7		10	21,864	-61.3		12	21,985	-57.9		17	21,985	-54.6	
30	9	23,663	-57.1		5	23,687	-57.5		7	23,731	-57.5														6	23,830	-54.1	

	GRAND JUNCTION, COLO. (858 MB.)				GREAT FALLS, MONT. (887 MB.)				GREEN BAY, WIS. (991 MB.)				GREENSBORO, N. C. (986 MB.)				HATTERAS, N. C. (1018 MB.)				HILO, T. H. (1013 MB.)				INTERNAT. FALLS, MINN. (973 MB.)			
SURFACE	31	1,474	-3.3	73	31	1,123	0.6	47	31	210	-4.7	79	31	273	2.1	76	31	3	8.0	73	31	9	22.3	80	31	360	-8.3	74
1000	31	237			31	144			31	141	-5.1		31	160			31	154	8.6	62	31	128	21.4	78	31	144		
950	31	654			31	566			31	552	-4.4	72	31	575	3.6	55	31	578	5.9	61	31	575	18.2	81	31	548	-8.0	72
900	31	1,089			31	1,005			31	971	-5.0	63	31	1,016	2.3	56	31	1,016	3.0	59	31	1,033	15.0	83	31	964	-7.5	68
850	31	1,544	-1.8	65	31	1,466	2.1	40	31	1,420	-5.5	54	31	1,477	1.1	51	31	1,478	1.6	48	31	1,515	12.1	82	31	1,410	-6.5	59
800	31	2,027	-1.6	54	31	1,953	-.5	44	31	1,895	-6.2	52	31	1,963	-.7	45	31	1,965	.3	39	31	2,022	9.5	77	31	1,883	-7.3	51
750	31	2,549	-2.9	49	31	2,469	-3.8	48	31	2,403	-8.0	52	31	2,480	-2.3	41	31	2,489	-1.8	35	31	2,568	7.0	69	31	2,388	-9.0	47
700	31	3,084	-4.9	42	31	3,007	-7.4	48	31	2,931	-10.6	52	31	3,023	-4.3	39	31	3,027	-4.0		31	3,122	4.3	56	31	2,915	-11.6	46
650	31	3,671	-7.7	40	31	3,585	-10.9	43	31	3,505	-13.4	51	31	3,607	-7.6	40	31	3,615	-6.8		31	3,723	1.1	54	31	3,483	-15.1	45
600	31	4,282	-11.2	38	31	4,191	-14.7	39	31	4,103	-16.7	50	30	4,222	-11.4	36	30	4,229	-10.4		31	4,362	-2.6	49	31	4,079	-18.6	43
550	31	4,950	-14.9	32	31	4,843	-19.4	37	31	4,752	-20.5	46	30	4,889	-15.5	37	30	4,901	-14.4	32	31	5,047	-6.6	43	31	4,728	-22.5	41
500	31	5,660	-19.3	32	30	5,550	-24.3	36	31	5,451	-24.8	44	30	5,598	-19.9		30	5,609	-19.0	32	30	5,787	-11.1	39	31	5,416	-27.1	42
450	31	6,443	-24.7	35	29	6,316	-30.2		31	6,212	-30.0	41	30	6,378	-25.3		30	6,392	-24.4		30	6,598	-16.3	38	31	6,172	-32.4	46
400	31	7,281	-30.8	36	29	7,141	-36.4		31	7,037	-36.0		30	7,216	-31.5		30	7,233	-30.6		30	7,466	-22.4	39	31	6,987	-38.1	
350	31	8,214	-37.9		29	8,053	-43.0		31	7,951	-42.5		28	8,152	-37.9		30	8,168	-37.4		30	8,431	-29.9	35	31	7,894	-44.5	
300	31	9,258	-45.2		29	9,077	-49.6		31	8,976	-48.7		28	9,198	-44.9		30	9,216	-44.3		30	9,509	-38.2		30	8,908	-50.7	
250	30	10,452	-52.8		29	10,255	-54.9		31	10,159	-53.4		26	10,392	-51.2		30	10,419	-50.8		30	10,738	-47.4		29	10,084	-55.3	
200	30	11,872	-57.3		28	11,675	-55.9		30	11,592	-52.3		26	11,829	-54.3		29	11,854	-54.0		30	12,183	-55.6		28	11,508	-52.6	
175	30	12,714	-57.6		28	12,527	-54.4		30	12,457	-51.5		26	12,682	-54.9		29	12,709	-54.9		26	13,033	-59.4		28	12,373	-52.0	
150	30	13,686	-57.4		27	13,511	-54.8		30	13,456	-51.8		26	13,665	-56.0		29	13,689	-57.1		22	14,000	-63.6		27	13,375	-52.4	
125	29	14,834	-58.5		27	14,678	-55.0		29	14,636	-53.3		25	14,813	-58.8		29	14,836	-59.0		17	15,103	-68.7		25	14,544	-52.4	
100	29	16,230	-60.1		27	16,101	-56.0		27	16,073	-53.6		24	16,204	-60.7		26	16,220	-61.6		11	16,442	-73.5		25	15,983	-53.0	
80	27	17,617	-60.1		27	17,521	-55.3		26	17,505	-54.3		20	17,570	-61.3		25	17,596	-62.7						23	17,415	-53.3	
60	25	19,411	-58.9		25	19,363	-54.3		25	19,346	-55.5		19	19,362	-60.8		25	19,373	-61.7						20	19,262	-54.1	
50	20	20,558	-59.0		22	20,536	-53.6		22	20,506	-55.9		16	20,496	-59.7		21	20,509	-60.9						17	20,423	-54.2	
40	13	21,941	-59.0		16	21,969	-54.0		16	21,915	-56.1		13	21,907	-59.3		19	21,896	-60.1						15	21,862	-54.5	
30	6	23,726	-58.8		12	23,822	-55.0		10	23,776	-56.1		8	23,694	-58.4		11	23,698	-58.9						8	23,728	-55.1	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

DECEMBER 1954

Standard pressure surface (mb.)	LAKE CHARLES, LA. (1019 MB.)				LANDER, WYO. (830 MB.)				LAS VEGAS, NEV. (943 MB.)				LITTLE ROCK, ARK. (1009 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	5	12.0	76	31	1,696	- 4.3	61	31	660	6.2	48	31	79	6.3	66
1000	31	163	14.0	65	31	194			31	178			31	153	6.9	61
950	31	596	12.4	58	31	611			31	604			31	581	6.6	57
900	31	1,048	10.5	53	31	1,046			31	1,052	8.9	38	31	1,018	5.5	52
850	31	1,522	9.0	50	31	1,505			31	1,522	6.2	37	31	1,485	5.0	45
800	31	2,023	7.3	41	31	1,988	- .5	40	31	2,017	3.8	35	31	1,979	3.5	46
750	31	2,561	5.2	35	31	2,508	- 1.7	34	31	2,547	1.8	28	31	2,505	1.2	43
700	31	3,113	2.9	30	31	3,049	- 4.8	33	31	3,094	.0		31	3,052	- 1.6	42
650	31	3,712	- .3		31	3,631	- 8.5	33	31	3,687	- 3.4		31	3,646	- 4.4	36
600	31	4,345	- 4.1		31	4,244	-12.2	33	31	4,312	- 7.3		31	4,266	- 8.3	34
550	30	5,026	- 8.4		31	4,905	-16.6	32	31	4,986	-11.8		31	4,941	-12.3	32
500	30	5,758	-13.2		31	5,612	-22.0	34	31	5,707	-16.9		31	5,658	-17.0	
450	30	6,560	-18.9		31	6,384	-27.6		31	6,495	-22.9		30	6,445	-22.8	
400	27	7,417	-25.3		31	7,216	-33.3		30	7,342	-29.5		30	7,292	-28.5	
350	37	8,371	-32.5		31	8,139	-40.2		30	8,279	-37.0		30	8,235	-35.3	
300	26	9,441	-40.3		31	9,172	-47.6		30	9,326	-45.0		30	9,291	-42.6	
250	25	10,656	-49.2		31	10,356	-54.4		30	10,520	-53.6		30	10,499	-50.4	
200	25	12,090	-56.9		30	11,761	-57.3		30	11,928	-60.2		29	11,932	-55.2	
175	24	12,928	-59.3		30	12,606	-56.5		30	12,760	-60.2		29	12,782	-56.2	
150	24	13,889	-61.1		30	13,583	-56.3		28	13,721	-61.1		29	13,757	-57.7	
125	22	15,009	-63.5		29	14,740	-57.1		28	14,849	-62.4		28	14,901	-59.6	
100	19	16,369	-65.6		28	16,147	-57.6		24	16,215	-64.2		27	16,286	-62.1	
80	15	17,722	-67.3		28	17,551	-58.4		19	17,587	-64.5		20	17,668	-62.9	
60	8	19,467	-64.1		24	19,369	-57.0		16	19,370	-62.2		16	19,453	-60.6	
50	6	20,573	-63.6		20	20,535	-57.0		15	20,494	-61.9		14	20,580	-60.4	
40					17	21,953	-57.0		12	21,878	-61.1		8	21,965	-60.0	
30					10	23,797	-56.8		9	23,679	-58.9		7	23,760	-58.3	

Standard pressure surface (mb.)	MAZATLAN, MEXICO (1012 MB.)				MEDFORD, ORE. (973 MB.)				MIAMI, FLA. (1019 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	14	22.3	79	31	401	3.1	88	31	4	16.6	77
1000	31	118	21.9	75	31	179			31	167	18.0	65
950	31	576	22.5	48	31	601	5.2	73	31	601	14.9	64
900	31	1,034	20.3	41	31	1,039	4.3	64	31	1,060	12.2	59
850	31	1,525	17.5	38	31	1,503	2.5	60	31	1,538	10.5	48
800	31	2,040	14.4	40	31	1,992	.1	57	31	2,041	9.2	36
750	31	2,590	10.6	41	31	2,510	- 2.4	55	31	2,580	7.6	
700	31	3,153	6.5	46	31	3,051	- 5.3	55	31	3,140	4.8	
650	31	3,762	2.6		30	3,635	- 8.5	55	31	3,745	1.9	
600	29	4,402	- 1.2		30	4,249	-11.8	47	31	4,382	- 1.7	
550	28	5,093	- 5.9		30	4,911	-15.7	42	30	5,070	- 6.2	
500	27	5,830	-10.8		28	5,626	-20.6	43	29	5,808	-11.2	
450	26	6,635	-16.6		28	6,405	-25.9	44	28	6,612	-17.1	
400	25	7,505	-22.9		28	7,239	-31.9	42	28	7,479	-23.6	
350	25	8,470	-30.2		27	8,174	-38.7		27	8,443	-30.8	
300	24	9,547	-38.5		27	9,213	-46.4		27	9,518	-39.3	
250	21	10,781	-48.8		27	10,405	-53.0		27	10,740	-48.5	
200	11	12,212	-59.0		26	11,812	-57.3		27	12,178	-57.4	
175					25	12,663	-56.5		26	13,013	-61.3	
150					25	13,641	-56.4		25	13,970	-63.7	
125					25	14,795	-57.4		24	15,074	-67.8	
100					23	16,200	-58.5		23	16,395	-71.3	
80					23	17,600	-58.9		21	17,707	-71.8	
60					20	19,416	-57.1		20	19,422	-66.8	
50					19	20,569	-56.7		20	20,529	-64.7	
40					16	21,992	-57.0		17	21,895	-62.3	
30					10	23,802	-56.4		10	23,691	-58.9	

Standard pressure surface (mb.)	MIDLAND, TEX. (919 MB.)				NANTUCKET, MASS. (1012 MB.)				NASHVILLE, TENN. (998 MB.)				NORTH PLATTE, NEBR. (918 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	871	10.5	42	31	14	2.8	82	31	177	3.7	79	31	848	- 2.8	73
1000	31	160			31	106	2.7	73	31	160	3.3		31	160		
950	31	594			31	522	.7	76	31	577	3.3	62	31	578		
900	31	1,044	11.7	34	31	956	- .6	66	31	1,014	2.0	57	31	1,009	1.8	57
850	31	1,521	10.2	30	31	1,412	- 2.0	65	31	1,474	1.6	49	31	1,472	2.2	46
800	31	2,022	7.6	30	31	1,892	- 4.0	62	31	1,962	.5	46	31	1,959	.3	41
750	31	2,557	4.9	29	31	2,404	- 6.3	58	31	2,485	- 1.8	48	31	2,478	- 2.4	39
700	31	3,110	1.7	29	31	2,936	- 8.7	56	31	3,023	- 4.7	46	31	3,018	- 5.5	37
650	31	3,708	- 1.6	29	31	3,512	-11.8	56	31	3,609	- 7.8	46	31	3,601	- 8.6	37
600	31	4,336	- 5.5	29	31	4,116	-15.5	55	31	4,221	-11.0	41	31	4,212	-12.6	36
550	31	5,016	- 9.8	32	31	4,772	-19.1	46	31	4,889	-14.8	36	31	4,874	-16.8	35
500	31	5,742	-14.9		31	5,472	-23.2	44	31	5,599	-19.3	36	31	5,578	-21.8	35
450	31	6,539	-20.4		31	6,240	-28.1	45	31	6,381	-24.7	36	31	6,353	-27.2	
400	31	7,393	-26.5		31	7,071	-34.0		31	7,219	-30.5		31	7,183	-33.4	
350	30	8,350	-33.3		31	7,994	-39.8		31	8,154	-37.0		31	8,107	-40.2	
300	30	9,414	-41.3		31	9,033	-45.6		31	9,204	-44.0		31	9,141	-47.5	
250	28	10,627	-49.7		31	10,232	-50.5		31	10,407	-50.7		31	10,326	-53.7	
200	27	12,068	-57.7		31	11,677	-52.5		30	11,845	-54.5		31	11,745	-57.1	
175	27	12,905	-59.8		31	12,540	-52.1		29	12,695	-54.6		31	12,591	-56.3	
150	26	13,859	-60.9		31	13,536	-52.8		29	13,679	-56.0		30	13,569	-56.0	
125	24	14,988	-63.3		31	14,708	-54.5		29	14,832	-58.0		29	14,722	-57.1	
100	23	16,349	-65.8		27	16,130	-56.2		29	16,228	-60.7		28	16,129	-58.9	
80	21	17,694	-66.9		22	17,548	-57.6		27	17,610	-61.2		27	17,522	-59.3	
60	19	19,442	-64.0		19	19,356	-57.7		24	19,402	-60.6		24	19,332	-58.8	
50	18	20,561	-62.5		17	20,499	-57.8		20	20,532	-60.4		21	20,481	-58.4	
40	15	21,935	-60.5		13	21,911	-58.3		15	21,909	-59.5		16	21,876	-59.2	
30	11	23,732	-59.2		6	23,735	-59.1		5	23,739	-58.3		6	23,697	-58.9	

Standard pressure surface (mb.)	OAKLAND, CALIF. (1021 MB.)				OKLAHOMA CITY, OKLA. (972 MB.)				OMAHA, NEBR. (969 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	6	9.0	76	31	391	4.9	63	31	403	- 1.2	74
1000	31	179	9.8	66	31	153			31	151		
950	31	607	8.9	59	31	579	7.4	51	31	567	- .1	66
900	31	1,051	7.4	52	31	1,021	7.7	44	31	996	.9	56
850	31	1,520	5.3	51	31	1,490	6.1	42	31	1,455	.6	47
800	31	2,013	2.9	50	31	1,985	4.1	42	31	1,940	- 1.2	45
750	31	2,539	.7	39	31	2,517	1.9	36	31	2,464	- 3.3	47
700	31	3,085	- 2.0	36	31	3,060	- 1.0	34	31	2,996	- 5.8	42
650	31	3,675	- 5.2	38	31	3,654	- 4.4		31	3,581	- 9.1	38
600	31	4,295	- 8.9	38	31	4,274	- 8.1		30	4,188	-12.9	38
550	31	4,970	-13.1	38	31	4,949	-12.6		30	4,849	-17.4	40
500	31	5,682	-18.2	38	31	5,665	-17.1		30	5,553	-22.5	40
450	31	6,470	-23.8	37	31	6,456	-22.7		30	6,330	-27.6	39
400	31	7,309	-30.0	39	31	7,299	-28.8		30	7,156	-33.7	
350	30	8,249	-37.2		31	8,239	-35.7		30	8,079	-40.1	
300	30	9,295	-45.0		31	9,292	-43.1		29	9,119	-46.8	
250	28	10,498	-53.4		31	10,496	-51.0		29	10,308	-53.1	
200	24	11,897	-60.1		30	11,924	-56.4		29	11,732	-56.2	
175	17	12,728	-60.2		29	12,769	-56.7		29	12,580	-55.5	
150	12	13,722	-59.2		29	13,742	-58.0		29	13,563	-55.7	
125					29	14,883	-60.3		29	14,720	-57.3	
100					29	16,268	-61.9		27	16,120	-58.4	
80					24	17,634	-63.0		26	17,519	-58.7	
60					21	19,414	-60.9		24	19,327	-59.0	
50					18	20,561	-60.8		21	20,478	-58.9	
40					13	21,965	-59.7		17	21,880	-58.6	
30					5	23,727	-58.7		9	23,692	-56.9	

Standard pressure surface (mb.)	PHOENIX, ARIZ. (979 MB.)				PITTSBURGH, PA. (975 MB.)				PORTLAND, ME. (1010 MB.)				RAPID CITY, S. DAK. (905 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	341	12.8	45	31	353	- 1.0	74	31	20	- 2.7	79	31	966	- 1.3	65
1000	31	157			31	146			31	99	- 2.2	71	31	156		
950	31	597	15.9	24	31	559	- 1.2	73	31	510	- 2.4	69	31	572		
900	31	1,049	13.4	22	31	984	- 3.7	74	31	935	- 3.9	67	31	1,009	1.0	55
850	31	1,527	10.3	23	31	1,434	- 5.4	75	31	1,384	- 5.4	64	31	1,471	2.1	42
800	31	2,028	7.2	26	31	1,909	- 6.5	66	31	1,859	- 6.4	57	31	1,958	- .3	40
750	31	2,562	4.5		31	2,418	- 8.5	61	31	2,367	- 8.2	53	31	2,476	- 3.2	38
700	31	3,115	1.6		31	2,944	-10.9	57	31	2,895	-11.0	54	31	3,014	- 6.4	38
650	31	3,712	- 1.9		31	3,516	-13.6	52	31	3,466	-14.1	51	31	3,594	-10.1	38
600	31	4,339	- 6.0		31	4,115	-16.9	51	31	4,064	-17.7	49	31	4,201	-14.1	41
550	31	5,017	-10.4		31	4,767	-20.3	48	31	4,714	-21.4	45	31	4,859	-18.3	
500	31	5,742	-15.2		31	5,463	-24.7	45	31	5,407	-25.9	43	31	5,562	-22.6	35
450	31	6,538	-20.9	37	31	6,228	-29.7	43	31	6,167	-30.7		31	6,330	-28.3	
400	31	7,390	-27.0	37	31	7,052	-35.7		31	6,990	-36.0		30	7,156	-34.8	38
350	31	8,338	-34.1		31	7,968	-41.3		31	7,905	-42.1		30	8,075	-41.6	
300	30	9,402	-42.0		31	8,999	-47.1		31	8,936	-47.4		30	9,104	-48.5	
250	27	10,598	-51.3		31	10,191	-51.5		31	10,131	-50.3		30	10,284	-54.7	
200	22	12,003	-58.9		30	11,629	-52.8		31	11,582	-51.3		30	11,705	-55.1	
175	22	12,840	-59.0		29	12,484	-53.0		30	12,443	-50.8		30	12,561	-53.9	
150	22	13,805	-59.4		29	13,475	-53.5		28	13,439	-51.4		30	13,550	-54.3	
125	21	14,941	-61.2		26	14,649	-55.1		26	14,610	-52.4		30	14,713	-56.0	
100	19	16,310	-63.5		20	16,053	-56.2		26	16,048	-53.9		29	16,132	-56.3	
80	14	17,688	-64.4		11	17,472	-56.8		25	17,473	-54.7		27	17,545	-56.6	
60	11	19,454	-62.8		5	19,284	-58.3		22	19,299	-56.5		23	19,377	-56.1	
50	7	20,583	-61.1						19	20,457	-57.0		20	20,525	-56.1	
40	5	21,958	-60.9						15	21,864	-57.3		15	21,959	-56.8	
30									10	23,673	-56.6		5	23,867	-57.5	

Standard pressure surface (mb.)	ST. CLOUD, MINN. (979 MB.)				SAN ANTONIO, TEX. (991 MB.)				SAN JUAN, P. R. (1014 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	316	- 6.0	82	31	243	13.9	50	31	19	23.9	80
1000	31	148			31	164			31	139	24.0	75
950	31	554	- 5.0	77	31	602	14.6	49	31	590	20.9	79
900	31	977	- 4.2	62	31	1,055	12.1	50	31	1,053	17.6	80
850	31	1,428	- 3.5	51	31	1,531	10.2	45	31	1,540	14.4	78
800	31	1,906	- 5.1	47	31	2,034	8.6	35	31	2,051	12.0	71
750	31	2,415	- 6.8	40	31	2,579	6.2	29	31	2,597	10.0	57
700	31	2,947	- 9.0	44	31	3,127	3.3		31	3,162	7.3	41
650	31	3,522	-12.0	42	30	3,730	- .2		31	3,775	4.4	
600	31	4,126	-15.8	42	30	4,360	- 4.0		31	4,416	.9	
550	31	4,779	-19.9	40	30	5,044	- 8.2		31	5,111	- 3.2	
500	31	5,477	-24.5	43	30	5,775	-12.9		31	5,857	- 7.7	
450	31	6,241	-29.8	43	30	6,580	-18.5		31	6,682	-13.3	
400	31	7,065	-35.9		30	7,439	-24.7	33	31	7,554	-20.0	
350	31	7,980	-42.6		30	8,395	-32.2		31	8,529	-27.1	
300	31	9,005	-49.4		30	9,464	-40.4		31	9,620	-35.4	
250	31	10,184	-54.7		30	10,682	-49.5		31	10,864	-44.2	
200	31	11,610	-53.7		30	12,112	-58.4		31	12,326	-54.4	
175	31	12,471	-52.3		30	12,947	-60.4		31	13,170	-59.7	
150	31	13,467	-52.6		28	13,900	-61.6		31	14,119	-65.5	
125	31	14,642	-53.3		25	15,024	-64.2		31	15,209	-71.5	
100	31	16,074	-54.5		24	16,381	-67.0		30	16,505	-76.9	
80	30	17,508	-54.4		23	17,726	-68.4		28	17,780	-77.9	
60	28	19,346	-55.1		20	19,462	-64.9		21	19,466	-68.2	
50	25	20,505	-55.8		19	20,580	-63.5		21	20,567	-65.4	
40	22	21,935	-56.7		15	21,958	-61.6		18	21,936	-62.0	
30	11	23,765	-56.7		11	23,758	-59.3		13	23,743	-58.2	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

DECEMBER 1954

Standard pressure surface (mb.)	SANTA MARIA, CALIF. (1012 MB.)				S. STE. MARIE, MICH. (990 MB.)				SPOKANE, WASH. (935 MB.)				SWAN ISLAND, W. I. (1015 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	74	9.7	72	31	221	- 5.7	78	31	722	- 0.8	85	31	10	24.5	78
1000---	31	172	11.9	63	31	139	- 8.7		31	180			31	138	24.2	75
950----	31	602	11.5	52	31	545	- 6.6	70	31	597			31	587	20.9	78
900----	31	1,051	9.6	44	31	963	- 7.5	64	31	1,026	- .2	74	31	1,053	17.7	76
850----	31	1,524	7.6	37	31	1,408	- 8.0	56	31	1,483	- 1.3	66	31	1,540	14.8	71
800----	31	2,021	5.5	32	31	1,877	- 9.4	51	31	1,965	- 3.0	63	31	2,051	11.9	68
750----	31	2,555	3.2		31	2,381	-11.2	47	31	2,481	- 5.8	62	31	2,596	9.8	52
700----	31	3,103	.4		31	2,901	-13.4	47	31	3,011	- 8.7	55	31	3,160	7.9	37
650----	31	3,699	- 3.1		31	3,469	-16.1	46	31	3,588	-12.3	54	31	3,773	5.0	26
600----	31	4,322	- 7.1		31	4,060	-19.3	47	31	4,189	-15.9	52	31	4,418	1.8	
550----	31	4,997	-11.5		31	4,705	-23.2	51	31	4,843	-20.0	47	30	5,115	- 2.3	
500----	31	5,720	-16.1		31	5,393	-27.8	52	31	5,539	-24.3	45	30	5,864	- 7.2	
450----	31	6,509	-21.8		31	6,146	-32.9	51	31	6,306	-29.8	42	30	6,687	-12.4	
400----	31	7,361	-28.2		30	6,962	-38.2		31	7,129	-35.7	44	29	7,567	-18.6	
350----	31	8,305	-35.1		27	7,858	-44.6		31	8,044	-42.2		29	8,547	-26.2	
300----	31	9,362	-43.1		17	8,872	-50.0		30	9,081	-48.9		29	9,641	-35.1	
250----	31	10,564	-52.4		5	10,066	-49.7		30	10,260	-54.6		29	10,885	-44.3	
200----	31	11,978	-60.5						29	11,683	-55.1		29	12,344	-54.9	
175----	31	12,807	-61.0						28	12,542	-53.4		28	13,186	-59.9	
150----	31	13,764	-61.1						24	13,554	-54.2		27	14,136	-65.2	
125----	31	14,893	-62.0						18	14,747	-55.6		26	15,229	-71.4	
100----	30	16,263	-63.4						5	16,231	-59.0		17	16,532	-77.7	
80-----	30	17,630	-63.7										11	17,809	-78.8	
60-----	30	19,396	-62.4													
50-----	24	20,528	-61.6													
40-----	20	21,929	-60.7													
30-----	8	23,722	-59.5													

Standard pressure surface (mb.)	TAMPA, FLA. (1020 MB.)				TATOOSH ISLAND, WASH. (1011 MB.)				VERACRUZ, MEXICO (1016 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	7	12.7	84	31	31	7.0	80	27	13	23.2	70
1000---	30	173	14.6	71	31	121	6.8	77	27	151	22.1	70
950----	30	607	12.7	67	31	545	5.1	71	27	594	18.9	67
900----	30	1,059	11.0	56	31	981	2.7	73	27	1,057	16.2	62
850----	30	1,535	9.7	42	31	1,441	- .1	72	27	1,542	13.8	57
800----	30	2,036	8.2	37	31	1,924	- 2.8	69	27	2,051	11.5	54
750----	30	2,574	6.1		31	2,440	- 5.5	63	27	2,596	9.4	44
700----	30	3,129	3.4	27	31	2,972	- 8.3	59	27	3,160	7.7	35
650----	30	3,734	.1	25	31	3,551	-11.5	58	27	3,773	4.7	30
600----	30	4,363	- 3.6	28	31	4,152	-15.2	56	27	4,416	1.0	
550----	30	5,050	- 7.5		31	4,806	-19.6	56	27	5,109	- 3.1	
500----	30	5,782	-12.3		31	5,504	-24.7	54	27	5,859	- 8.1	
450----	30	6,588	-18.0		31	6,267	-30.2	51	26	6,680	-13.7	
400----	30	7,448	-24.7		31	7,091	-36.0	51	26	7,556	-20.2	
350----	30	8,406	-31.4		31	8,004	-42.6		26	8,531	-27.8	
300----	30	9,479	-39.5		31	9,029	-48.8		25	9,618	-36.3	
250----	30	10,701	-48.4		31	10,210	-53.3		23	10,855	-46.0	
200----	27	12,128	-56.7		31	11,642	-53.0		22	12,306	-56.1	
175----	27	12,969	-59.1		31	12,504	-52.0		22	13,144	-60.9	
150----	27	13,929	-61.5		31	13,499	-52.5		20	14,090	-66.1	
125----	27	15,050	-64.9		30	14,676	-53.6		16	15,188	-71.1	
100----	27	16,398	-67.9		29	16,112	-54.2		12	16,498	-76.5	
80-----	21	17,740	-68.6		26	17,538	-53.5		6	17,772	-78.4	
60-----	20	19,472	-65.4		25	19,389	-52.8					
50-----	18	20,581	-63.9		20	20,572	-52.5					
40-----	15	21,949	-61.5		16	22,026	-52.2					
30-----	8	23,738	-59.1		14	23,891	-53.2					

Standard pressure surface (mb.)	WASHINGTON, D. C. (1007 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	88	1.7	67
1000---	31	146	1.4	63
950----	31	562	.5	63
900----	31	991	- 1.4	65
850----	31	1,446	- 2.6	60
800----	31	1,925	- 4.2	57
750----	31	2,436	- 6.9	58
700----	31	2,967	- 9.1	54
650----	31	3,546	-11.7	50
600----	31	4,148	-14.8	46
550----	31	4,805	-18.7	44
500----	31	5,505	-23.1	
450----	31	6,277	-27.6	
400----	31	7,107	-33.2	
350----	31	8,033	-39.5	
300----	31	9,074	-45.6	
250----	31	10,273	-50.6	
200----	31	11,716	-52.9	
175----	31	12,576	-53.0	
150----	30	13,564	-54.3	
125----	29	14,720	-56.4	
100----	28	16,130	-58.2	
80-----	27	17,535	-59.6	
60-----	25	19,328	-58.9	
50-----	23	20,468	-59.3	
40-----	22	21,865	-58.9	
30-----	17	23,661	-58.0	
20-----	12	26,194	-57.1	
15-----	6	28,005	-55.7	

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20 *Air Force Data for August 1954

Standard pressure surface (mb.)	DENVER, COLO. (835 MB.)				FT. WORTH, TEX. (992 MB.)				OGDEN, UTAH (853 MB.)				RANTOUL, ILL. (989 MB.)				ROME, N. Y. (996 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,661	22.5	41	30	178	31.5	46	30	1,450	23.3	28	31	227	21.7	85	31	146	15.8	81
1000---	31	48			30	106			30	34			31	131			31	117	15.2	
950----	31	514			30	571	30.0	45	30	500			31	583	22.0	72	31	558	16.7	72
900----	31	995			30	1,049	26.5	49	30	981			31	1,048	19.8	69	31	1,016	14.0	71
850----	31	1,499			30	1,550	22.4	54	30	1,481	24.0	25	31	1,539	17.0	63	31	1,496	10.9	69
800----	31	2,029	22.0	40	30	2,074	18.2	59	30	2,010	21.7	24	31	2,054	13.9	60	31	1,999	7.9	67
750----	31	2,590	18.0	43	30	2,629	14.0	60	30	2,569	16.9	27	31	2,602	11.1	55	31	2,533	5.4	60
700----	31	3,172	13.4	49	30	3,203	10.5	53	30	3,147	11.9	32	31	3,169	7.6	57	31	3,091	2.4	60
650----	31	3,794	8.3	55	30	3,821	6.9	40	30	3,762	6.6	38	31	3,781	4.0	52	31	3,689	- .8	55
600----	31	4,447	3.0	61	29	4,470	3.0	40	30	4,412	.8	45	31	4,423	.3	49	31	4,323	- 3.8	49
550----	31	5,145	- 2.6	66	29	5,172	- 1.5	41	30	5,107	- 5.1	51	31	5,117	- 3.7	43	31	5,006	- 8.1	42
500----	31	5,894	- 8.2	62	29	5,923	- 6.0	37	30	5,845	-10.8	48	31	5,863	- 7.8	43	31	5,738	-12.4	38
450----	31	6,715	-13.6	53	29	6,750	-11.3	33	30	6,655	-16.1	37	31	6,683	-13.2	35	31	6,536	-17.9	35
400----	31	7,589	-19.7	40	29	7,633	-17.6	33	30	7,523	-22.5		31	7,561	-19.3		31	7,405	-24.0	37
350----	31	8,567	-26.8		29	8,618	-25.0		30	8,488	-29.8		31	8,539	-26.7	37	31	8,365	-30.8	
300----	31	9,660	-34.8		28	9,721	-33.5		30	9,568	-38.0		31	9,633	-35.0		31	9,440	-38.7	
250----	31	10,907	-44.3		28	10,975	-43.3		30	10,799	-46.8		29	10,880	-44.3		31	10,667	-47.2	
200----	29	12,365	-54.4		28	12,442	-54.9		30	12,252	-54.4		29	12,343	-54.3		30	12,130	-54.2	
175----	29	13,210	-59.2		28	13,282	-60.8		30	13,102	-56.9		29	13,188	-59.3		30	12,980	-56.7	
150----	29	14,164	-63.8		28	14,229	-65.8		30	14,071	-59.7		28	14,143	-63.3		30	13,951	-59.0	
125----	25	15,269	-66.8		25	15,320	-70.2		29	15,204	-61.9		28	15,254	-66.3		30	15,089	-60.7	
100----	23	16,615	-67.0		13	16,637	-70.2		29	16,581	-62.0		23	16,603	-65.3		29	16,475	-60.2	
80-----	19	17,974	-62.6		6	17,973	-67.7		25	17,963	-59.4		13	17,973	-61.5		28	17,873	-58.1	
60-----	18	19,769	-57.6		5	19,732	-61.0		25	19,781	-56.1		11	19,770	-56.7		23	19,697	-54.9	
50-----	18	20,924	-55.7		5	20,871	-58.7		24	20,945	-54.5		7	20,953	-54.5		22	20,867	-53.1	
40-----	16	22,355	-53.0		5	22,278	-56.0		23	22,378	-52.7		5	22,362	-52.5		21	22,305	-52.0	
30-----	11	24,212	-50.4						19	24,245	-50.0						16	24,177	-49.7	
20-----									9	26,934	-46.1									

* September data for the above Air Force stations will be included in the January 1955 issue of this publication.

Note: All observations scheduled at 0300, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Table 21

DECEMBER 1954

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	292	2.4	31	274	0.7	31	260	4.4	27	295	2.7	30	132	0.5	31	167	1.0
500	--	---	----	--	---	----	--	---	----	--	---	----	--	---	----	31	186	2.0
1,000	29	272	4.1	--	---	----	--	---	----	27	296	6.3	30	131	1.0	30	206	2.5
1,500	28	283	5.6	--	---	----	31	260	8.9	26	300	10.1	30	184	1.8	26	296	2.9
2,000	28	288	7.5	31	295	1.6	31	273	8.7	26	300	11.4	28	227	3.1	23	303	6.1
2,500	28	286	9.4	31	295	4.4	30	280	9.4	25	303	12.5	24	260	4.9	23	288	6.4
3,000	28	287	10.2	29	292	7.3	29	284	10.8	23	301	15.0	22	254	5.4	23	287	8.0
4,000	27	290	14.0	28	293	10.3	25	290	11.1	21	304	13.7	19	274	6.8	20	289	9.3
5,000	26	283	14.9	26	286	13.3	20	300	13.3	17	296	16.3	16	272	9.3	16	288	10.5
6,000	23	292	16.0	24	289	14.1	20	306	14.8	16	303	16.2	14	264	10.0	13	281	13.2
8,000	15	302	17.1	20	294	16.8				12	289	13.8				10	275	19.0
10,000	13	289	21.8	18	288	20.2												
12,000				10	293	16.7												
14,000																		
16,000																		

Altitude (meters) m.s.l.	* Buffalo, N. Y. (182 m.)			Burlington, Vt. (100 m.)			Charleston, S. C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)			Ely, Nev. (1,910 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	255	2.3	28	195	1.0	30	248	2.3	27	229	2.0	31	265	1.9	31	235	0.4
500	31	275	5.3	28	234	3.3	28	252	2.9	27	246	3.9	--	---	----	--	---	----
1,000	31	282	7.4	21	270	5.4	28	256	5.0	21	253	5.5	--	---	----	--	---	----
1,500	31	285	8.3	12	280	7.1	27	272	8.1	16	260	8.1	31	263	2.8	--	---	----
2,000	31	286	8.9				26	279	11.6	14	263	10.6	31	266	4.3	31	250	.5
2,500	31	286	10.1				23	282	13.4	14	273	11.6	31	270	5.5	31	261	1.3
3,000	31	287	12.0				22	285	14.7	11	284	11.1	31	272	7.3	27	265	2.9
4,000	31	287	14.2				18	278	19.6				31	278	10.7	21	267	6.5
5,000	30	285	14.8				14	272	24.4				27	286	12.0	21	280	8.9
6,000	30	284	18.5				12	284	22.8				24	285	13.4	20	265	10.9
8,000	28	282	24.9										22	282	15.5	15	279	10.8
10,000	28	275	29.9										14	285	17.9			
12,000	25	273	26.2										11	275	23.0			
14,000	22	275	20.1															
16,000	14	280	15.7															

Altitude (meters) m.s.l.	Grand Junction, Colo. (1,475 m.)			Green Bay, Wis. (210 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Little Rock, Ark. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	338	0.7	28	290	0.9	30	281	1.9	31	252	3.9	29	281	1.2	29	250	1.3
500	--	---	----	28	301	2.1	30	264	3.5	--	---	----	29	243	3.2	29	272	3.1
1,000	--	---	----	24	272	4.5	29	263	5.6	31	257	7.9	27	246	5.5	24	268	4.5
1,500	31	338	.7	20	283	5.6	28	276	7.9	31	265	11.3	26	266	8.7	20	270	6.2
2,000	31	216	.1	19	292	7.0	23	295	11.3	31	272	11.2	26	276	10.5	19	269	9.1
2,500	31	203	1.7	16	298	7.5	20	291	12.4	29	280	11.6	23	281	11.9	18	282	11.4
3,000	29	245	2.8	15	302	8.3	20	291	15.6	26	284	12.0	21	281	13.3	18	281	13.0
4,000	26	281	6.9	13	317	13.2	18	290	20.3	21	285	11.7	16	284	18.0	16	289	16.2
5,000	23	298	11.2	11	319	12.9	14	299	23.3	15	280	11.4	15	284	21.3	14	299	21.2
6,000	20	297	12.9				10	295	26.6	13	274	13.3	12	280	23.1			
8,000	16	299	18.4							10	265	13.9						
10,000																		
12,000																		
14,000																		
16,000																		

Altitude (meters) m.s.l.	Medford, Ore. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			** Oakland, Calif. (8 m.)			Omaha, Nebr. (306 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	29	186	0.6	31	84	1.1	27	267	1.5	27	245	2.0	31	245	0.2	30	338	1.4
500	29	177	.6	31	53	1.1	25	282	2.4	27	234	3.3	31	19	.9	30	336	1.6
1,000	28	166	3.1	31	307	.7	23	284	4.7	21	246	3.7	31	269	1.0	28	291	2.4
1,500	23	178	5.0	30	275	2.0	19	300	7.7	20	284	6.2	31	243	2.5	27	288	4.7
2,000	19	199	6.3	28	273	3.4	19	296	10.0	19	292	9.4	31	254	4.0	27	301	6.5
2,500	15	219	4.6	28	274	4.8	18	297	11.3	18	288	11.1	31	263	4.9	24	304	9.1
3,000	14	233	5.1	28	266	6.4	18	290	12.1	16	297	13.4	31	259	6.6	24	305	10.2
4,000	11	252	4.9	26	283	9.5	16	288	15.7	16	294	17.3	31	267	8.5	21	312	12.8
5,000	10	238	5.7	24	279	12.8	15	288	18.8	14	296	19.0	31	267	11.7	21	311	13.4
6,000	11	277	5.8	23	282	16.0	10	287	21.1	10	298	18.4	31	268	12.6	19	308	16.6
8,000	11	287	12.2	15	279	22.2							31	270	18.1	13	295	23.1
10,000													31	270	23.7			
12,000													28	266	21.3			
14,000													25	273	17.6			
16,000													18	271	10.8			

Altitude (meters) m.s.l.	Phoenix, Ariz. (345 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	339	0.3	30	339	3.5	29	196	0.4	25	269	1.1	31	218	1.6
500	31	29	.7	--	---	----	29	241	.6	24	252	2.6	31	241	1.4
1,000	31	73	1.4	30	340	3.9	21	248	3.6	19	261	5.7	30	232	1.9
1,500	31	108	1.4	30	319	6.9	20	264	5.3	16	273	6.7	28	272	3.0
2,000	30	103	.3	30	311	8.7	20	281	7.6	16	282	8.4	25	292	5.2
2,500	30	274	2.2	27	312	10.2	19	281	8.7	16	294	10.7	24	290	7.6
3,000	30	279	4.4	27	307	11.6	18	276	8.9	14	281	11.6	24	284	9.2
4,000	27	288	7.5	22	304	12.5	15	285	8.0	13	290	11.8	19	289	11.8
5,000	26	284	10.1	18	302	14.8	11	266	9.0	11	285	13.0	16	285	13.6
6,000	21	291	11.6	17	303	16.8	10	276	11.1	11	282	16.5	15	282	15.0
8,000	12	313	11.8	10	299	24.0									
10,000															
12,000															
14,000															
16,000															

Altitude (meters) m.s.l.	San Diego Calif. (13 m.)			% Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (725 m.)			# Washington, D. C. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	290	2.6	31	301	1.5	29	168	1.5	31	269	2.4
500	31	330	1.8	31	314	2.4	--	---	----	31	277	5.2
1,000	30	13	1.0	31	311	3.5	29	191	4.7	31	273	8.0
1,500	29	334	1.4	31	319	4.9	24	225	7.0	31	279	9.3
2,000	29	303	2.6	31	314	6.1	23	240	7.8	31	277	10.8
2,500	28	297	4.0	31	313	7.5	20	245	8.4	31	274	11.8
3,000	27	296	5.0	31	318	8.6	16	270	6.5	31	277	14.2
4,000	26	288	6.1	31	319	9.8	15	272	9.0	31	277	17.9
5,000	22	294	7.7	31	313	11.3	14	285	11.3	31	270	20.4
6,000	20	294	7.4	31	315	12.9	14	301	12.8	31	266	22.9
8,000	15	312	6.3	28	308	16.8	12	307	19.9	31	265	29.8
10,000	11	323	7.5	12	305	21.3				31	265	35.8
12,000	11	315	10.2							29	271	29.6
14,000										27	272	26.5
16,000										24	269	16.8

% Rawin Data

* Rawin Data (Cont'd.)

18,000 m., 10 obs., 289 dir., 8.8 speed

** Rawin Data (Cont'd.)

18,000 m., 17 obs., 268 dir., 4.3 speed
20,000 m., 15 obs., 65 dir., 2.9 speed
22,000 m., 14 obs., 81 dir., 8.2 speed
24,000 m., 14 obs., 75 dir., 10.5 speed

# Rawin Data (Cont'd.)

18,000 m., 20 obs., 263 dir., 8.4 speed
20,000 m., 14 obs., 242 dir., 5.9 speed
22,000 m., 10 obs., 165 dir., .8 speed

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

RAWIN DATA

Average monthly resultant winds

Table 22

DECEMBER 1954

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Buffalo, N. Y. (182 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S. C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N. C. (275 m.)			Hatteras, N. C. (3 m.)			Int. Falls, Minn. (358 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	27	1.1	31	260	0.6	31	139	1.4	29	258	1.9	29	8	1.7	31	280	2.0	31	233	1.4	31	161	0.5	31	86	1.0	30	257	0.9	31	268	2.8	31	237	1.3
500	--	---	----	--	---	----	31	170	3.3	29	270	5.1	29	278	1.0	31	288	2.3	31	242	4.7	31	243	2.5	--	---	----	30	266	3.1	29	271	6.6	30	240	2.1
1,000	--	---	----	30	300	6.4	31	205	1.9	29	289	7.4	28	265	2.5	30	270	2.9	29	259	5.7	31	282	5.0	--	---	----	30	263	5.7	26	271	8.1	30	271	5.0
1,500	--	---	----	30	311	8.0	31	266	1.2	29	290	8.0	25	276	5.3	29	279	3.5	20	267	6.9	31	293	6.1	31	85	1.0	29	270	7.0	25	271	9.8	30	285	6.8
2,000	31	317	3.5	30	308	9.5	31	282	2.8	29	296	8.5	25	270	7.5	29	265	5.5	29	275	10.2	31	297	7.2	31	155	.1	29	269	8.5	24	273	11.3	29	293	8.0
2,500	31	294	5.2	30	308	11.5	31	293	4.6	29	300	9.0	25	270	9.6	29	258	6.8	29	276	12.8	31	296	9.1	31	179	1.3	29	276	10.3	23	278	13.3	29	292	8.7
3,000	31	288	6.0	30	310	12.5	31	293	6.6	29	298	10.0	25	275	10.3	28	271	8.2	26	278	14.0	31	295	11.1	31	240	3.3	29	279	12.8	22	276	14.5	30	291	9.4
4,000	31	290	8.5	27	301	13.2	31	287	9.4	29	290	11.5	25	279	13.4	26	265	10.4	23	282	19.3	31	291	13.9	31	273	6.9	29	280	14.2	19	273	17.5	31	291	10.8
5,000	30	290	11.7	26	298	13.3	31	280	11.5	29	292	14.1	22	275	16.4	24	262	13.2	18	287	18.8	30	293	17.2	30	284	10.8	28	281	17.6	16	267	19.6	31	295	12.9
6,000	25	285	12.8	25	290	15.8	28	281	13.2	29	292	16.4	21	274	17.2	21	248	13.5	15	286	20.0	30	290	19.1	29	292	12.4	25	280	19.6	12	270	17.3	31	296	15.0
8,000	17	314	12.5	18	268	14.0	25	269	16.0	26	286	23.0	15	281	23.6	17	258	15.3				30	283	25.6	19	310	11.9	20	283	23.7				31	300	20.0
10,000	15	315	15.3	13	254	16.8	18	278	21.0	24	285	24.0	12	278	33.1	14	258	20.4				30	283	32.5	13	324	13.9	12	281	22.9				29	307	22.6
12,000	12	311	14.2	12	275	19.2	12	271	26.2	22	282	18.6				12	250	19.3				20	278	33.5										28	298	20.1
14,000				11	279	15.6				15	275	16.6				11	255	17.1				22	273	23.8										26	294	18.3
16,000										13	271	12.9				10	247	9.9				21	275	16.9										25	288	13.9
18,000																						17	296	6.3										20	295	12.0
20,000																						12	274	1.9										18	295	8.2
22,000																																		14	307	6.9

	Little Rock, Ark. (80 m.)			Medford, Ore. (401 m.)			Miami, Fla. (4 m.)			Midland, Tex. (871 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			St. Cloud, Minn. (318 m.)			San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)		
Surface	31	247	0.3	31	177	0.7	31	29	1.4	31	237	0.9	27	303	2.8	31	261	0.8	31	106	1.1	30	322	0.8	31	323	2.0	31	289	0.4	31	106	0.5	31	94	2.6
500	31	243	1.8	29	158	.9	31	66	1.9	--	---	----	27	289	6.2	31	223	3.2	31	83	.4	30	293	1.0	--	---	----	31	281	.9	31	156	1.6	31	86	6.8
1,000	30	257	4.8	29	169	3.3	31	130	.4	31	252	2.0	27	272	5.9	29	240	6.0	31	249	1.3	28	277	4.3	31	322	2.3	31	297	3.0	31	230	2.5	31	80	7.7
1,500	27	274	6.4	29	200	4.6	31	270	1.2	31	269	3.7	27	256	9.2	29	267	7.3	31	254	2.3	29	291	5.6	30	306	6.2	31	299	4.0	31	265	4.1	31	79	6.7
2,000	25	270	8.5	31	216	5.8	31	266	3.2	31	284	6.0	26	259	10.9	29	279	9.8	31	262	3.7	27	295	7.8	30	315	7.5	31	298	5.0	31	273	5.4	31	72	6.3
2,500	24	267	11.1	31	230	6.4	31	273	4.4	31	286	8.3	25	257	11.8	28	282	11.2	31	263	4.6	29	299	8.8	30	311	8.3	31	299	6.4	30	281	7.1	31	68	6.1
3,000	23	277	13.8	30	243	7.4	31	270	5.5	31	287	8.6	25	256	14.7	28	280	12.7	31	263	5.5	28	291	9.6	29	305	8.6	31	300	7.8	30	280	8.1	31	60	5.1
4,000	16	297	15.1	29	245	8.7	31	275	10.0	31	285	11.3	23	263	16.1	26	276	14.3	31	267	7.4	28	289	12.5	29	292	11.2	30	304	9.6	30	278	12.2	31	68	2.1
5,000	11	290	16.3	24	253	10.5	30	270	12.5	29	279	13.3	18	270	15.8	21	281	17.3	30	273	10.2	27	276	14.2	28	283	14.9	29	298	10.8	28	276	15.2	31	28	2.6
6,000				21	254	10.5	26	279	14.7	27	274	16.2	15	258	17.6	17	278	17.6	30	270	13.0	25	268	17.3	25	286	16.1	27	297	12.3	27	265	16.1	31	335	3.5
8,000				19	263	14.1	24	280	20.6	21	275	21.1				13	293	20.9	28	269	15.2	19	264	18.0	17	288	18.4	22	289	14.6	22	273	24.2	31	302	8.6
10,000				13	285	15.0	21	280	25.8	13	288	24.4							26	268	25.6	11	271	10.0	15	289	23.9	18	284	16.5	17	277	29.0	31	294	17.4
12,000							16	277	30.8										20	272	24.4				14	287	22.0	18	277	16.9	12	265	35.1	31	276	23.8
14,000							14	281	27.6																11	288	17.7	18	286	15.9				30	277	22.6
16,000							10	268	21.5																11	278	16.2	18	287	11.2				29	283	14.3
18,000																												19	300	12.1				24	350	2.4
20,000																												15	305	6.7				20	123	3.5
22,000																												12	2	3.9				15	80	1.9
24,000																																		11	288	5.1

	Santa Maria, Calif. (72 m.)			Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is., Wash. (33 m.)			Washington, D. C. (88 m.)		
Surface	31	101	0.5	31	18	1.3	30	176	1.4	31	139	4.5	31	284	2.3
500	31	31	2.5	31	341	1.6	--	---	----	31	178	8.4	31	278	6.4
1,000	31	40	1.8	31	316	3.4	30	195	4.9	31	200	10.4	31	285	8.3
1,500	31	11	1.8	31	321	4.4	30	221	7.8	31	205	11.3	31	281	9.4
2,000	31	334	3.0	31	320	6.1	30	235	8.6	31	215	12.8	31	276	11.0
2,500	31	311	4.2	31	320	7.0	30	247	8.9	31	223	13.4	31	274	12.5
3,000	31	288	5.4	31	320	7.5	30	252	10.1	31	229	12.8	31	274	13.4
4,000	30	279	7.7	31	320	10.9	29	256	11.8	30	235	15.7	31	275	16.3
5,000	29	275	9.0	31	318	12.7	28	268	12.9	31	237	17.4	31	274	20.6
6,000	24	287	9.3	31	320	13.6	28	271	13.9	30	241	18.1	31	273	24.5
8,000	21	289	10.9	23	315	18.8	25	295	15.2	30	249	22.7	31	270	30.5
10,000	16	297	14.1				25	295	18.8	27	256	26.7	30	275	38.3
12,000	14	298	16.9				24	283	17.2	25	257	21.5	30	272	33.8
14,000	12	314	8.5				19	275	12.0	25	261	17.9	28	278	27.3
16,000	11	318	4.8							25	273	13.8	25	274	18.6
18,000	11	360	1.8							22	297	7.0	24	272	10.8
20,000	12	82	6.7							20	52	5.1	24	264	1.9
22,000	11	85	10.7							15	76	8.1	22	18	2.3
24,000										13	75	13.4	16	55	2.4
26,000													12	49	3.5

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following Table 22 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

RAWIN DATA

Average monthly resultant winds

Table 22 *Air Force Data for August 1954

Altitude (meters) m.s.l.	Denver, Colo. (1,661 m.)			Ft. Worth, Tex. (178 m.)			Ogden, Utah (1,450 m.)			Rantoul, Ill. (227 m.)			Rome, N. Y. (146 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	159	1.7	31	162	1.9	31	109	0.5	31	72	1.5	31	299	0.1
500	--	---	----	30	165	8.4	--	---	----	30	69	1.7	30	271	2.3
1,000	--	---	----	30	169	8.7	--	---	----	30	291	1.0	30	274	4.5
1,500	--	---	----	30	177	6.8	28	138	1.1	30	289	3.2	30	287	5.4
2,000	31	178	3.2	30	188	5.6	28	187	4.2	30	293	5.5	31	291	6.4
2,500	31	180	2.5	30	200	4.2	28	202	4.9	31	293	7.2	31	291	8.7
3,000	31	203	2.1	30	190	2.7	28	209	5.6	31	304	9.0	31	293	9.6
4,000	30	246	3.1	30	206	.8	28	228	6.9	30	305	11.7	30	288	11.4
5,000	30	268	5.4	30	138	.9	30	230	10.3	30	302	13.1	30	290	13.2
6,000	29	271	7.3	30	111	.6	30	236	12.4	31	295	14.9	30	285	16.4
8,000	30	259	12.5	31	284	.1	31	232	18.0	31	290	18.3	31	290	21.3
10,000	31	251	16.9	30	258	1.0	31	231	23.7	28	281	21.3	30	285	28.2
12,000	30	242	21.3	30	227	3.0	29	238	26.1	26	286	25.4	29	282	35.0
14,000	30	251	17.9	30	237	1.2	28	235	22.3	27	291	21.1	29	277	28.7
16,000	24	255	11.8	19	80	2.0	26	238	15.5	26	292	13.5	28	281	15.1
18,000	18	186	2.2				22	244	1.7	10	299	6.8	25	288	6.6
20,000	18	75	2.1				21	110	1.5				20	315	1.0
22,000	16	94	5.4				20	83	4.5				18	89	2.2
24,000	12	93	6.1				19	94	7.5				14	89	6.2
26,000							10	93	7.3						

* September data for the above Air Force stations will be included in the January 1955 issue of this publication.

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following Table 22 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun. **DECEMBER 1954**

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
ALBUQUERQUE, N. MEX.									
	Air mass								
	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0
Dec.									
5	0.94	1.03	1.14	1.25	----	1.18	1.04	0.97	0.90
6	.90	.96	1.10	1.24	----	1.19	1.09	1.02	.90
7	----	.96	----	----	----	1.18	----	----	----
8	.92	1.02	1.14	1.26	----	1.25	1.12	.98	.90
9	.92	1.03	1.13	1.27	----	----	----	----	----
14	.93	1.07	1.19	1.32	----	1.29	1.19	1.13	1.06
16	----	.89	.51	.86	DUSTY	1.13	1.04	.95	.91
17	.96	1.08	1.09	1.36	----	1.27	1.18	----	.96
21	----	----	----	----	----	----	1.16	1.03	.94
22	.96	1.04	1.12	1.26	----	1.26	1.05	.90	.82
23	.97	1.04	1.12	1.23	----	1.02	1.04	.92	----
24	.84	.94	1.06	----	----	----	----	----	.94
25	.75	.85	1.00	1.12	----	----	----	----	----
26	.93	1.01	1.12	----	----	----	----	----	----
28	.82	.92	1.03	1.17	----	1.19	1.04	.93	.83
29	----	1.03	----	----	----	----	1.10	----	----
30	.82	.95	1.06	1.15	----	1.13	1.01	.92	.80
31	.86	----	----	----	----	----	----	----	----
Averages	.89	.99	1.06	1.21	----	1.19	1.09	.98	.91
Departures	-.10	-.09	-.15	-.15	----	-.17	-.13	-.13	-.11
MADISON, WIS.									
	Air mass								
	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81
Dec.									
4	----	----	1.09	----	----	----	1.08	0.93	0.85
5	----	----	----	----	----	----	1.23	1.13	1.05
7	0.80	0.95	1.08	----	----	----	1.09	.93	.81
10	----	----	----	----	----	----	1.20	1.09	.99
23	.89	1.04	1.18	----	----	----	----	----	----
24	1.00	1.11	1.24	----	----	----	----	----	----
Averages	.90	1.03	1.15	----	----	----	1.13	1.02	.95
Departures	.01	.02	-.01	----	----	----	-.05	----	----
WASHINGTON, D. C. (WBCO)									
	Air mass								
	4.95	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.95
Dec.									
6	----	----	----	----	----	----	1.15	1.03	0.90
7	0.73	0.90	1.07	----	----	----	----	----	----
8	----	.98	1.03	----	----	----	----	----	----
21	.64	.73	1.05	----	----	----	----	----	----
22	----	----	----	----	----	----	1.01	.85	----
27	.70	.80	.91	----	----	----	----	----	----
30	----	----	1.17	----	----	----	----	----	----
Averages	.69	.85	1.05	----	----	----	1.08	.94	.90

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
LINCOLN, NEBR.									
	Air mass								
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77
Dec.									
2	0.55	0.76	0.96	----	----	----	1.05	0.92	0.83
3	.72	.85	1.02	----	----	----	----	----	----
6	.70	.83	.98	----	----	----	----	----	----
9	.89	1.00	1.13	----	----	----	1.18	1.07	.96
14	----	----	----	----	----	----	1.14	.99	.90
22	.85	.96	1.11	----	----	----	----	----	----
23	.94	1.07	1.20	----	----	----	1.22	1.11	1.03
31	.89	1.00	1.13	----	----	----	----	----	----
Averages	.79	.92	1.08	----	----	----	1.15	1.02	.93
Departures	-.13	-.14	-.12	----	----	----	-.04	-.03	-.01
TABLE MOUNTAIN, CALIF.									
	Air mass								
	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76
Dec.									
4	----	----	----	1.52	----	----	----	----	----
10	----	----	----	1.50	----	----	----	----	----
11	----	----	----	1.52	----	----	----	----	----
16	----	----	----	1.49	----	----	----	----	----
18	----	----	----	1.52	----	----	----	----	----
19	----	----	----	1.53	----	----	----	----	----
22	1.19	1.33	1.38	1.52	----	----	----	----	----
26	----	----	----	1.51	----	----	----	----	----
Averages	1.19	1.33	1.38	1.51	----	----	----	----	----
Departures	-.04	.01	-.04	-.03	----	----	----	----	----
BLUE HILL, MASS.									
	Air mass								
	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86
Dec.									
8	----	----	----	----	----	----	1.11	1.05	0.95
12	1.10	1.21	1.31	----	----	----	----	----	----
13	1.03	1.12	1.22	----	----	----	1.26	1.10	----
17	1.05	1.13	1.25	----	----	----	----	----	----
19	.72	.84	1.02	----	----	----	----	----	----
22	----	----	1.20	----	----	----	1.27	1.11	1.01
25	1.09	1.20	1.34	----	----	----	1.33	1.19	1.10
Averages	1.00	1.10	1.22	----	----	----	1.24	1.11	1.02
Departures	.08	.06	.05	----	----	----	.09	.07	.07

*Extrapolated

Langley is the unit used to denote one gram calorie per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

SOLAR RADIATION DATA

DECEMBER 1954

Table 31a Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	3	4	5	6	7	8	9		10	11	12	13	14	15	16		17	18	19	20	21	22	23	
Langleys	53	47	49	17	69	74	37	49	26	39	51	46	16	37	49	38	44	13	45	42	18	73	66	43
Date	24	25	26	27	28	29	30	31	Avg.															
Langleys	52	60	58	64	50	38	25	53	50															

Table 31b Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	3	4	5	6	7	8	9		10	11	12	13	14	15	16		17	18	19	20	21	22	23	
Langleys	89	65	114	20	103	114	66	82	33	29	167	153	12	33	131	80	152	3	126	83	15	181	86	92
Date	24	25	26	27	28	29	30	31	Avg.															
Langleys	101	175	159	99	102	28	20	107	99															

Table 31c Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	3	4	5	6	7	8	9		10	11	12	13	14	15	16		17	18	19	20	21	22	23	
Langleys	209	287	201	8	339	379	84	215	54	155	313	497	12	63	242	191	363	8	394	265	7	522	126	241
Date	24	25	26	27	28	29	30	31	Avg.															
Langleys	290	---	459	296	165	36	32	233	216															

Table 31d Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	3	4	5	6	7	8	9		10	11	12	13	14	15	16		17	18	19	20	21	22	23	
Langleys	104	116	83	18	135	199	31	98	22	145	82	151	12	38	71	75	65	3	109	108	13	197	96	85
Date	24	25	26	27	28	29	30	31	Avg.															
Langleys	63	200	150	136	97	35	44	60	98															

Table 31e Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

								Avg								Avg								Avg
Date	3	4	5	6	7	8	9		10	11	12	13	14	15	16		17	18	19	20	21	22	23	
Langleys	92	65	99	18	75	89	46	69	41	52	126	41	16	57	67	57	47	10	44	81	10	52	91	48
Date	24	25	26	27	28	29	30	31	Avg.															
Langleys	64	43	54	89	82	63	29	102	66															

Note: Langley is the unit used to denote one gram calorie per square centimeter.

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.

1954	Albrook Air Base Panama, C. Z.	Albuquerque, N.Mex.	Annette, Alaska	Astoria, Oreg.	Atlanta, Ga.	Bethel, Alaska	Bismarck, N. Dak.	Blue Hill, Mass.	Boise, Idaho	Brownsville, Tex.	Canton Island, Pacific Area	Caribou, Me.	Charleston, S. C.	Columbia, Mo.	Davis, Calif.	Dodge City, Kans.	East Lansing, Mich.	East Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Ely, Nevada	Fairbanks, Alaska	Fresno, Calif.	Grand Junction, Colo.	Great Falls, Mont.	Greensboro, N. C.	Griffin, Ga.	Hatteras, N. C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.	Lake Charles, La.	Lander, Wyo.	Las Vegas, Nevada	Lincoln, Nebr.
Dec. 3----	374	245	6	74	322	30	179	127	81	394	619	178	(290)	257	32	319	121	84	43	297	81	6	(47)	161	175	229	341	329	125	40	190	242	198	69	203
Dec. 4----	556	264	5	46	298	8	178	145	106	370	624	97	333	141	123	145	72	162	80	352	200	12	269	98	158	236	320	299	---	334	87	273	45	310	32
Dec. 5----	501	342	79	66	30	12	159	119	141	356	574	64	(267)	128	123	302	208	189	69	378	252	6	252	282	172	70	59	266	144	234	197	309	224	281	189
Dec. 6----	307	345	---	66	218	14	55	20	124	(411)	592	130	---	284	104	(339)	175	31	79	359	229	5	173	265	143	227	213	10	---	260	133	377	186	233	158
Dec. 7----	467	312	2	128	316	29	25	167	146	390	617	35	---	217	221	227	138	219	99	364	244	9	293	277	139	255	342	332	237	325	108	360	191	300	194
Dec. 8----	537	347	49	65	136	27	100	171	203	386	---	151	---	12	225	261	119	202	110	369	287	---	270	278	172	218	162	331	82	295	194	312	225	238	59
Dec. 9----	618	316	65	58	292	18	68	61	70	173	651	118	57	215	8	313	19	89	---	267	261	---	(52)	247	130	23	280	77	33	235	59	378	221	123	219
Averages-----	480	310	34	72	230	20	109	116	125	(354)	613	111	(237)	179	119	(272)	122	140	79	341	222	7	(193)	230	156	180	244	235	124	246	138	322	184	222	150
Departures---	---	---	---	---	---	---	---	-16	---	---	---	---	---	---	-42	---	36	7	---	---	---	3	---	---	---	---	---	---	---	---	34	---	---	---	-22
Dec. 10----	296	192	---	105	336	32	165	51	91	236	656	36	325	239	217	(138)	32	108	102	217	98	---	118	157	125	202	362	308	115	326	12	360	118	207	127
Dec. 11----	200	116	18	99	287	15	173	82	210	293	597	124	301	70	205	151	215	79	55	363	282	5	253	242	172	185	315	315	194	333	44	290	191	302	192
Dec. 12----	166	310	50	10	219	18	172	146	137	286	---	143	303	16	121	311	45	176	55	364	289	6	231	260	95	69	258	293	25	---	80	119	165	300	157
Dec. 13----	302	292	11	84	29	24	41	186	92	407	568	170	20	228	183	265	182	196	59	360	266	(4)	227	98	115	17	46	22	71	---	199	218	178	198	230
Dec. 14----	503	339	5	33	71	---	172	22	167	389	642	150	75	133	121	303	20	31	49	(347)	273	(3)	55	241	51	185	73	122	52	290	24	349	212	303	200
Dec. 15----	391	262	11	113	273	21	127	66	147	400	662	32	310	242	24	268	59	86	71	336	242	6	68	158	51	147	347	139	41	221	26	372	193	141	194
Dec. 16----	385	326	6	152	279	17	43	114	203	360	647	49	332	144	154	110	73	170	69	157	264	6	42	285	161	202	343	300	116	319	66	289	222	314	66
Averages-----	321	262	14	85	213	21	128	95	150	339	629	101	238	153	147	(221)	89	121	66	(306)	245	(5)	142	206	110	144	249	214	88	298	64	285	183	252	167
Departures---	---	---	---	---	---	---	---	-39	---	---	---	---	---	---	-6	---	-1	-17	---	---	---	1	---	---	---	---	---	---	---	---	-44	---	---	---	4
Dec. 17----	420	335	54	158	94	24	---	154	202	179	638	168	271	47	167	151	25	183	83	364	263	5	74	269	164	179	152	293	35	317	79	167	214	319	141
Dec. 18----	282	332	---	159	234	31	---	16	210	368	---	32	324	79	44	204	30	40	90	355	275	4	45	259	161	147	280	32	53	328	45	340	206	321	160
Dec. 19----	571	343	6	36	---	38	---	163	220	386	632	69	284	128	49	271	140	202	77	355	270	5	43	263	170	158	123	303	134	330	70	351	230	304	193
Dec. 20----	518	344	37	90	297	24	163	121	139	378	644	72	352	231	37	308	120	180	47	304	272	2	57	277	149	196	331	209	106	322	154	343	233	303	202
Dec. 21----	577	349	29	2	190	32	142	15	199	378	647	49	334	54	28	306	225	32	60	318	264	3	39	248	99	246	263	324	195	332	68	299	216	305	188
Dec. 22----	474	346	79	89	252	29	155	183	194	339	617	84	212	121	11	300	85	204	79	---	256	---	64	259	146	238	309	214	226	328	195	293	191	300	176
Dec. 23----	500	340	16	62	294	14	164	108	181	247	---	123	309	245	20	282	24	105	34	358	232	5	93	247	158	240	324	308	217	288	62	333	144	302	209
Averages-----	477	341	32	85	227	27	156	109	192	325	636	85	298	129	51	260	93	135	67	342	262	4	59	260	150	201	254	241	138	321	96	304	205	308	182
Departures---	---	---	---	---	---	---	---	-26	---	---	---	---	---	---	-77	---	3	-9	---	---	---	-1	---	---	---	---	---	---	---	---	-5	---	---	---	16
Dec. 24----	510	348	48	57	314	12	139	139	36	121	---	130	300	243	30	293	149	171	47	355	219	4	36	248	140	252	344	302	157	321	72	144	204	268	196
Dec. 25----	479	277	57	65	163	30	136	193	224	109	647	173	285	208	205	284	150	213	77	353	260	4	64	171	187	266	134	322	217	314	155	319	216	293	167
Dec. 26----	358	313	20	111	147	---	113	174	172	167	637	76	242	79	208	179	102	220	123	356	288	4	129	144	113	197	123	302	131	326	194	161	199	293	27
Dec. 27----	422	141	1	66	168	26	117	146	206	(391)	660	84	263	71	221	39	6	187	65	331	(226)	(5)	258	139	163	211	204	195	56	349	156	172	232	316	14
Dec. 28----	424	349	82	50	74	23	139	103	70	149	651	59	238	39	54	251	16	101	50	363	193	6	140	276	68	79	107	134	23	276	30	95	230	295	210
Dec. 29----	431	334	37	20	55	16	160	70	71	329	656	144	309	59	199	340	26	---	88	321	117	6	75	225	95	124	65	209	16	321	52	368	119	305	211
Dec. 30----	560	341	30	---	317	24	---	32	61	172	638	25	335	270	12	301	116	---	75	365	143	(5)	166	269	51	259	349	293	44	252	68	261	162	286	155
Dec. 31----	469	259	39	43	169	16	---	140	81	230	653	132	281	256	15	299	163	172	74	375	131	5	96	96	104	210	149	301	199	268	55	76	183	218	206
Averages-----	457	295	39	59	176	20	134	125	115	(208)	649	103	282	153	118	248	91	177	75	352	(197)	(5)	120	196	115	200	185	257	105	303	98	199	193	284	148
Departures---	---	---	---	---	---	---	---	-5	---	---	---	---	---	---	-18	---	9	36	---	---	---	0	---	---	---	---	---	---	---	---	1	---	---	---	-14

Accumulated Departures January 1 to December 31, 1954

	Albrook Air Base Panama, C. Z.	Albuquerque, N.Mex.	Annette, Alaska	Astoria, Oreg.	Atlanta, Ga.	Bethel, Alaska	Bismarck, N. Dak.	Blue Hill, Mass.	Boise, Idaho	Brownsville, Tex.	Canton Island, Pacific Area	Caribou, Me.	Charleston, S. C.	Columbia, Mo.	Davis, Calif.	Dodge City, Kans.	East Lansing, Mich.	East Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Ely, Nevada	Fairbanks, Alaska	Fresno, Calif.	Grand Junction, Colo.	Great Falls, Mont.	Greensboro, N. C.	Griffin, Ga.	Hatteras, N. C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.	Lake Charles, La.	Lander, Wyo.	Las Vegas, Nevada	Lincoln, Nebr.
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Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.-Continued DECEMBER 1954

	Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBCO)	Madison, Wis.	Matanuska, Alaska	Medford, Oreg.	Miami, Fla.	Midland, Tex.	Nashville, Tenn.	Newport, R. I.	New York, N. Y.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Ottawa, Ontario	Phoenix, Ariz.	Prosser 4 NE, Wash.	Rapid City, S. Dak.
1954																	
Dec. 3----	260	101	39	71	30	65	401	302	280	129	214	231	318	(128)	248	155	210
Dec. 4----	197	185	221	185	22	102	408	273	251	185	121	273	202	54	---	145	112
Dec. 5----	63	152	143	190	18	174	412	326	12	185	125	11	323	(221)	337	93	179
Dec. 6----	290	156	145	177	18	222	211	329	292	26	55	277	317	(177)	227	131	177
Dec. 7----	204	253	249	176	8	183	358	310	240	236	200	237	192	(119)	272	168	193
Dec. 8----	46	244	260	112	19	164	358	321	42	188	207	182	334	(140)	326	154	159
Dec. 9----	291	124	107	76	14	121	385	256	99	68	21	250	354	29	94	104	208
Averages-----	193	173	166	141	18	148	362	303	174	145	135	209	291	(124)	251	136	177
Departures---	---	---	---	26	---	---	---	---	26	7	11	---	---	---	---	---	---
Dec. 10----	175	315	284	177	19	---	327	205	259	136	148	230	235	57	108	177	129
Dec. 11----	28	301	288	77	13	74	392	229	114	104	99	131	13	152	336	29	203
Dec. 12----	20	307	298	27	3	58	277	335	27	183	150	72	227	84	345	36	231
Dec. 13----	73	263	250	155	16	76	367	297	17	180	105	33	---	227	239	137	89
Dec. 14----	211	222	228	88	14	68	400	277	42	20	8	53	329	116	353	108	201
Dec. 15----	287	257	249	20	9	87	330	324	44	145	82	64	332	---	135	173	119
Dec. 16----	200	255	261	116	4	146	414	144	129	129	235	181	307	---	---	170	169
Averages-----	142	274	265	94	11	85	358	259	90	128	118	109	241	118	253	119	163
Departures---	---	---	---	-26	---	---	---	---	-40	-14	1	---	---	---	---	---	---
Dec. 17----	71	292	257	47	12	198	395	302	41	186	63	14	332	(167)	352	190	91
Dec. 18----	120	304	293	77	---	203	159	309	128	27	4	103	298	26	346	189	175
Dec. 19----	282	308	297	138	10	178	342	320	60	199	160	63	---	113	331	40	181
Dec. 20----	251	306	297	48	11	181	419	313	151	175	201	185	340	(170)	291	32	199
Dec. 21----	260	313	293	106	6	174	435	318	220	38	87	46	351	(135)	226	28	181
Dec. 22----	253	294	289	(34)	9	132	428	327	193	226	243	187	345	194	339	67	164
Dec. 23----	262	261	250	120	8	101	372	150	261	133	164	263	318	30	327	54	191
Averages-----	214	297	282	(81)	8	167	364	291	151	141	132	123	331	(119)	316	86	169
Departures---	---	---	---	-38	---	---	---	---	9	1	17	---	---	---	---	---	---
Dec. 24----	279	228	231	172	23	96	337	295	274	155	166	299	325	(117)	---	104	169
Dec. 25----	251	219	160	128	14	130	332	320	268	233	237	295	248	(164)	267	64	109
Dec. 26----	149	272	246	19	31	152	360	234	256	203	190	281	159	(130)	337	174	146
Dec. 27----	41	263	264	12	31	160	340	305	51	197	192	209	70	(70)	287	154	163
Dec. 28----	35	230	209	143	29	(97)	337	138	3	86	105	43	136	16	338	50	183
Dec. 29----	127	264	248	35	16	47	357	233	178	62	39	54	364	(141)	324	114	187
Dec. 30----	288	254	239	109	---	30	372	223	237	74	147	208	307	45	342	44	130
Dec. 31----	101	212	185	155	20	113	394	328	72	176	128	142	363	(106)	270	149	135
Averages-----	159	243	223	97	24	(103)	354	260	168	148	150	191	246	(99)	309	107	153
Departures---	---	---	---	-21	---	---	---	---	39	9	26	---	---	---	---	---	---

	Richland, Wash.	Riverside, Calif.	St. Cloud, Minn.	Santa Maria, Calif.	S. Ste. Marie, Mich.	Sayville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle, Wash. (WBAS)	State College, Pa.	Stillwater, Okla.	Swan Island, W. I.	Tampa, Fla.	Toronto, Ontario	Upton, N. Y.	Wake Island, Pacific Area	Winnipeg, Manitoba
1954																	
Dec. 3----	142	34	171	33	46	238	145	93	70	96	270	465	395	141	212	366	108
Dec. 4----	78	336	227	252	143	169	144	124	81	24	128	459	396	56	168	58	117
Dec. 5----	65	208	234	271	166	137	193	180	38	137	273	485	361	214	136	207	169
Dec. 6----	97	235	205	216	198	19	127	126	36	179	288	467	227	205	33	297	127
Dec. 7----	167	311	203	305	75	239	168	221	47	206	245	209	404	200	225	210	56
Dec. 8----	136	321	59	287	137	210	161	228	60	184	266	481	382	132	199	461	30
Dec. 9----	97	112	75	116	15	28	26	23	18	12	295	320	320	18	50	460	61
Averages-----	112	222	168	211	112	149	138	142	50	120	252	412	355	138	146	294	95
Departures---	---	-11	---	---	---	---	---	---	---	-8	---	---	---	---	---	---	---
Dec. 10----	158	180	198	303	87	173	97	128	85	65	80	484	423	85	174	369	78
Dec. 11----	38	329	110	306	81	197	89	103	94	31	55	458	389	73	148	159	53
Dec. 12----	26	332	170	282	150	181	54	118	8	56	---	456	353	33	180	400	136
Dec. 13----	110	264	170	242	110	141	162	59	54	51	285	476	67	71	(150)	(386)	72
Dec. 14----	80	284	(93)	224	58	3	29	33	23	---	---	461	308	71	16	455	44
Dec. 15----	161	268	(57)	278	33	96	70	106	95	24	258	441	324	27	151	398	79
Dec. 16----	157	317	71	291	191	205	58	76	123	23	244	411	407	204	199	(447)	41
Averages-----	104	282	(124)	275	101	143	80	89	67	36	184	455	325	81	(145)	(373)	72
Departures---	---	58	---	---	---	---	---	---	---	-71	---	---	---	---	---	---	---
Dec. 17----	158	293	85	218	36	165	128	82	130	61	251	406	363	54	164	263	64
Dec. 18----	156	329	101	---	93	3	14	23	54	99	239	457	266	42	16	452	73
Dec. 19----	34	333	103	301	170	225	63	212	58	111	271	141	329	133	218	436	49
Dec. 20----	46	326	71	303	102	223	137	217	95	171	275	303	392	173	225	434	29
Dec. 21----	29	332	31	302	155	68	57	212	18	162	279	379	393	199	75	465	106
Dec. 22----	66	327	136	(290)	38	240	162	232	105	140	279	298	369	143	227	463	111
Dec. 23----	60	320	125	261	32	147	71	171	34	143	268	467	372	7	180	460	67
Averages-----	79	323	93	(279)	89	153	90	164	70	127	266	350	355	107	158	425	71
Departures---	---	100	---	---	---	---	---	---	---	6	---	---	---	---	---	---	---
Dec. 24----	150	306	98	281	75	169	98	176	25	51	271	173	207	173	179	437	91
Dec. 25----	73	274	57	305	37	241	181	222	25	201	201	461	149	50	234	474	125
Dec. 26----	163	302	91	311	113	241	145	---	98	205	121	477	314	125	---	444	153
Dec. 27----	137	248	136	(307)	84	215	125	---	67	173	4	456	253	14	---	448	149
Dec. 28----	64	192	185	264	67	117	44	---	25	58	41	469	339	8	131	448	120
Dec. 29----	106	168	203	299	100	33	94	19	28	21	301	448	310	104	67	465	82
Dec. 30----	47	264	83	283	150	135	31	180	14	4	258	382	234	23	(125)	419	120
Dec. 31----	147	193	156	203	103	160	130	140	40	66	299	471	338	132	147	461	57
Averages-----	111	243	126	(282)	91	164	106	147	40	97	187	417	268	79	(147)	449	112
Departures---	---	25	---	---	---	---	---	---	---	-9	---	---	---	---	---	---	---

Accumulated Departures January 1 to December 31, 1954

Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBCO)	Madison, Wis.	Matanuska, Alaska	Medford, Oreg.	Miami, Fla.	Midland, Tex.	Nashville, Tenn.	Newport, R. I.	New York, N. Y.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Ottawa, Ontario	Phoenix, Ariz.	Prosser 4 NE, Wash.	Rapid City, S. Dak.
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Richland, Wash.	Riverside, Calif.	St. Cloud, Minn.	Santa Maria, Calif.	S. Ste. Marie, Mich.	Sayville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle, Wash. (WBAS)	State College, Pa.	Stillwater, Okla.	Swan Island, W. I.	Tampa, Fla.	Toronto, Ontario	Upton, N. Y.	Wake Island, Pacific Area	Winnipeg, Manitoba
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Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

DELAYED DATA

Section	Temperature								Precipitation					
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes			
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least
	°F	°F.		°F.			°F		In.	In.		In.		In.
May 1954														
Alaska	41.2	2.7	Fort Yukon CAA	79	31	Umiat	-8	13	0.95	-0.38	Adak	16.10	2 Stations	T
June 1954														
Alaska	50.4	.1	Skagway	86	26	Barter Island	21	10	1.41	-.06	Little Port Walter	9.02	Chitina	0.00
Hawaii	73.7	.2	Mahukona	96	22	Haleakala RS	44	9+	4.62	.58	Wahiawa Mtn.	23.01	11 Stations	.00
July 1954														
Alaska	52.8	-1.4	Fort Yukon CAA	88	16+	Anaktuvuk Pass	26	11	2.80	.45	Whittier	13.69	Point Hope	.35
Hawaii	73.4	-.3	2 Stations	94	12+	Kole Kole	35	1+	8.60	3.64	Kahana	39.35	Puako	T
August 1954														
Alaska	52.5	1.6	Fort Yukon CAA	88	8	Tok	23	30	2.84	-.24	Whittier	11.01	Haines 1S	.01
Hawaii	74.7	.2	Puunene CAA AP	95	11	Kole Kole	38	17	7.33	1.62	Pepeekeo AF	38.20	8 Stations	.00
September 1954														
Alaska	43.1	.6	Uganik	78	16	Anaktuvuk	-1	25	3.09	.01	Little Port Walter	16.67	Hughes	.31
Hawaii	74.4	.1	Puunene CAA AP	95	11	Kole Kole	36	17	3.80	-.96	Pepeekeo AF	16.40	9 Stations	.00
October 1954														
Alaska	31.4	2.2	2 Stations	70	1	Barter Island	-9	23	2.29	-.36	Ketchikan	27.27	2 Stations	.04
Hawaii	73.9	.2	Puunene CAA AP	93	22	Haleakala RS	40	27+	3.83	-1.74	Kahana	17.03	5 Stations	.00
November 1954														
Hawaii	73.1	1.2	Kahului AP	91	11	Haleakala RS	40	27	6.98	.69	Olaa	23.33	Puako	.00

See footnotes with current data.

CLIMATOLOGICAL DATA

Table 2

State and station	Elevation (ground)	Pressure		Temperature								No. of days		Average dew point	Average relative humidity	Precipitation			No. of days		Snow, Sleet, Hail		Wind		Fastest mile			No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below			Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.		#		°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
November 1954																																
ALASKA																																
Anchorage	92	994.9	1000.2	33	22	27.6	5.3	47	1	6	15	0	27	22	76	0.93	-0.07	0.25	11	0	8.0	4	4.5	N	*34	S	28	2	4	24	8.5	26
Annette	110	1003.1	1007.0	49	42	45.8	5.1	53	4+	32	30	0	1	43	89	16.18	5.96	2.16	26	1	T	0	18.1	SE	*50	SE	20	0	1	29	9.7	--
Barrow	22	1012.2	1013.0	6	-5	.5	-.2	26	3	-25	29+	0	30	-6	71	.20	-.07	.09	5	0	3.0	8	9.6	---	21	E	3	a	a	a	a	--
Bethel	21	996.3	997.6	29	17	22.6	5.6	48	2	-2	26	0	28	20	85	.87	-.10	.29	10	0	3.4	1	12.7	NNE	*33	S	30	1	8	21	8.3	--
Cordova	40	998.0	999.6	41	30	35.6	4.5	48	5	11	30	0	20	33	89	12.71	2.16	1.86	24	0	.8	1	6.1	E	*25	SE	20	1	7	22	8.7	--
Fairbanks	436	986.1	1003.9	20	5	12.6	9.5	43	2	-9	29	0	30	8	80	.42	-.21	.43	6	0	7.5	6	3.5	N	30	W	28	7	8	15	6.4	--
Juneau	15	1003.7	1004.5	42	34	38.4	5.3	52	1	15	30	0	11	35	89	5.67	-.25	.92	26	0	2.0	2	7.4	ESE	45	SE	18	1	0	29	9.5	12
Kotzebue	10	1004.7	1005.3	17	4	10.4	2.9	36	3	-17	30	0	30	6	80	.39	-.04	.13	10	0	15.8	9	13.6	NNE	*52	ENE	30	10	7	13	5.7	--
McGrath	334	989.2	1002.3	20	5	12.1	6.6	46	2+	-21	29	0	29	8	81	1.85	.76	.91	10	0	17.2	14	2.8	N	*29	SSE	30	4	5	21	7.8	--
Nome	13	1000.7	1001.4	26	14	20.1	3.3	40	2+	-3	21	0	29	14	75	1.09	-.05	.38	8	0	14.1	7	12.3	N	57	SW	30	5	9	16	6.8	33
Northway	1713	941.4	1006.1	17	4	10.7	12.9	40	1	-31	30	0	30	9	88	.19	-.17	.06	6	0	4.3	5	3.0	NW	*27	NW	28	1	5	24	9.0	--
St. Paul Island	22	995.3	996.2	38	30	33.9	.1	42	2	22	28	0	20	32	89	1.40	-1.19	.40	17	0	2.4	T	----	---	--	---	--	2	4	24	8.6	--
Yakutat	28	999.7	1001.4	44	32	37.7	4.0	48	5+	14	30	0	13	35	89	12.41	-3.05	1.63	26	0	1.1	1	9.8	ESE	*55	S	20	4	2	24	8.6	--

a Sun continuously below horizon after the 17th.
Also see footnotes with current data.

Maximum 70°F. or above for Alaskan stations.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
April 1954										
Menard (4 miles north of), Menard County, Tex.	7	P.m.							Wind and hail	Golf-ball size hail broke 25 windows at 1 ranch house; autos damaged.
Clyde, Callahan County, Tex.	11	5 p.m.							do	Golf-ball size hail covered ground
Seminole, Gaines County, Tex.	11	5:30 p.m.					$120,000		Hail	4 inches of hail reported in parts of Seminole. Damage estimated by insurance adjustor.
Schulenburg (4 miles northwest and 8 miles north of), Fayette County, Tex.	14				0	0			Tornado	2 barns destroyed.
Markham, Matagorda County, Tex.	15	5:57 p.m.			0	0	7,000		do	New barn destroyed; 4 homes, power lines and TV antennas damaged.
Elmendorf, Bexar County, Tex.	15				0	0			do	Barn lifted and collapsed in air. At least 6 farms had damage.

Table 4—Continued

DELAYED DATA

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons: Killed	Number of persons: Injured	Estimated damage: Property (exclusive of crops)	Estimated damage: Crops	Character of storm	Remarks
April 1954 Cont'd.										
San Marcos, Hayes County, Tex.	15				0	0			Tornado	Highway Patrol reported cloud over San Marcos.
San Antonio, Bexar County, Tex.	15								Wind	Aircraft damaged at Stinson Field. May have been same storm as at Elmendorf.
Seguin, Guadalupe County, Tex.	15				0	0			Tornado	May have been same as Elmendorf storm.
Pecos, Reeves County, Tex.	21	P.m.			0	0	$0	$0	do	No damage reported; not known to have touched ground.
Lamesa (6 miles east of), Dawson County, Tex.	21	7:15 p.m.							Hail	Hail reported size of baseballs.
Lamesa (10 miles south of), Dawson County, Tex.	21	8 p.m.			0	0	0	0	Tornado	Department of Public Safety reported tornado in contact with ground, but no damage.
Big Spring (2 miles north of), Howard County, Tex.	27	2 p.m.			0	0			do	
Over Lake J. B. Thomas (near Snyder) Scurry County, Tex.	27	2 p.m.			0	0			Tornadoes	2 tornadoes reported.
Abilene (10 miles north of), Taylor County, Tex.	29				0	0	0	0	Tornado	No damage found.
Caldwell, Burleson County, Tex.	30	Early a.m.					25,000		Wind	Dairy barns unroofed; homes moved off foundations; large trees blown down.
Kyle-Lytton Springs, Hays of and Caldwell Counties, Tex.	30	5:37 a.m.	15		0	0	100,000		Tornado	Damage to gin, homes, outbuildings, and TV antennas. Trees uprooted.
May 1954										
Buffalo Springs, Clay County and Bowie Montague County, Tex.	1	P.m.	17		0	0			do	Barns, fencing and timber damaged and destroyed. Feed store unroofed and suffered structural damage at Bowie. Moved eastward.
Mulberry-Ravenna, Fannin County, Tex.	1	P.m.			0	0			do	Barn and outbuildings damaged. Trees twisted and broken
DeLeon, Comanche County, Tex.	2	1 a.m.			0	0			do	Garage total loss. Chicken house lifted from foundation.
Leagueville (11 miles east of Athens), Henderson County, Tex.	2				0	4			do	1 home completely destroyed, 2 others damaged.

Table 4—Continued

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
May 1954 (Cont'd.)										
South Sulphur Community, Hunt County, Tex.	6	8 a.m.			0	0			Tornado	Barn and tractor shed destroyed. Trees uprooted.
Hilburn Community (8 miles northwest of Rising Star), Eastland County, Tex.	6	P.m.			0	0			do	Dairy building unroofed and partly demolished. Fences and trees damaged.
Nomangee, Leon County, Tex.	10	2:30 p.m.			0	0	Hundreds of dollars		do	Home damaged. Several barns damaged or destroyed. Trees and shrubs uprooted.
Austin, Travis County, Tex.	11	3:30 p.m.					$15,000		Wind	Roofs of 2 buildings blown off. Other roofs damaged. Trees uprooted. Barn blown over.
Oakland, Colorado County, Tex.	11	8 p.m.		880					Wind and hail	Home wrecked as 2 trees fell on it. Corn damaged by wind and hail. Small buildings damaged.
Navasota (2 miles east of), Grimes County, Tex.	11	8 p.m.			0	0			Tornado	Destroyed barns, sheds, and billboards. Moved northeastward.
Ezzel-Provident area, Lavaca County, Tex.	11	P.m.			0	0			do	Sheds blown down. Buildings and barns damaged.
Hankamer, Chambers County, Tex.	12	1:20 a.m.			0	0			do	6-room home shoved 10 feet from foundation. 2 outbuildings destroyed.
Andrews, Andrews County, Tex.	17				0	0			do	Tornado cloud not touching ground.
Gainesville, Cooke County, Tex.	17				0	0			do	Funnel observed by many persons as it moved from west of town to 2 miles north. No report of touching ground.
Goodnight (10 miles south of), Armstrong County, Tex.	17	1:39 p.m.			0	0			do	Tornado cloud not touching ground.
Galveston, Galveston County, Tex.	19	8:28 a.m.			0	0			do	Sighted southeast of Galveston.
Saragosa, Reeves County, Tex.	21	P.m.	10	*4					Hail	10,000 acres of cotton and several hundred acres of tomato plants totally destroyed or damaged.
Gem, Hemphill County, Tex.	22	9 p.m.			0	0		$2,500	Tornado and hail	Funnel hit 200 yards southeast of home. Tore up terrace, demolished several sheds, pulled posts from ground, and uprooted trees. Several hundred acres of grain destroyed by hail.
Royse City (3 miles northeast of), Hunt County, Tex.	25	6:15 p.m.			0	0			Tornado	Confirmed tornado noted on teletype from Dallas and Fort Worth.
Iraan, Pecos County, Tex.	26						Thousands of dollars		Hail	Many windows knocked out. Autos and buildings damaged. Largest hail size of baseballs.
Anson, Jones County, Tex.	26				0	0	0	0	Tornado	Oil field worker saw tornado touch ground. No damage reported.
Winters, Runnels County, Tex.	26	8 p.m.							Wind	70 to 90 m.p.h. winds; little damage.
DeLeon (5 miles north of), Comanche County, Tex.	27	1:20 a.m.			0	0	0	0	Tornado	Touched ground, but no damage reported.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

Table 4—Continued

DELAYED DATA

Place	Date	Time	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
May 1954 (Cont'd.)										
Saginaw Tarrant County, Tex.	28	8:45 p.m.			0	0			Tornado	Highway Patrol saw cloud 10 miles north of Fort Worth; apparently did not reach ground.
Crane (14 miles west of), Crane County, Tex.	29	6 p.m.			0	2			do	Oil rig smashed; engine house from rig found 10 miles away. 2 persons seriously injured.
June 1954										
Aberdeen, Big Horn County, Mont.	26	Afternoon			1				Electrical	Man killed while stacking hay during thunderstorm.
Bitterroot Valley (near Hamilton), Mont.	30	6 p.m.	10	*4			$2,000		Electrical and wind	
July 1954										
Starkville, Miss.	2	8:30 p.m.					5,000		Wind and electrical	Unroofed building at drive-in. Disrupted power and telephone lines. Lightning set house afire.
Sidney, Mont.	30	2-3 p.m.	50	*4-10				$250,000	Hail	Damage to wheat, oats, and barley. Hailstones size size of marbles.
Aug. 1954										
	29									Minor storm reported at Hineston, La.
Sept. 1954										
	7									Minor storm reported at Baton Rouge, La.
Oct. 1954										
Pennsylvania, western portion	15-16								Rains	Rains from hurricane Hazel and active low pressure trough created sudden flooding. Following counties declared "disaster" areas: Westmoreland, Fayette, Allegheny, Somerset, Beaver, Butler, and Lawrence.
Pennsylvania, eastern portion	15								Winds	Final report on 1,000,000 bushels of apples knocked off trees in orchards--130,000 bushels could not be used for processing or for eating fresh, and had to be written off as complete loss.
Nov. 1954										
Iowa, northern half	30	All day			2				Snow	Man killed when pickup truck skidded on icy road. Another man killed when he fell from sanding truck.

See footnotes with current data.

RADIOSONDE DATA

Average monthly values

Table 20

DELAYED DATA

Standard pressure surface (mb.)	[a] HAVANA, CUBA (1013 MB.)				[b] HAVANA, CUBA (1013 MB.)				[c] HAVANA, CUBA (1008 MB.)				[d] HAVANA, CUBA (1012 MB.)				[e] HAVANA, CUBA (1008 MB.)				[f] HAVANA, CUBA (1009 MB.)				[g] HAVANA, CUBA (1011 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	49	19.7	81	21	49	21.6	83	31	49	23.9	85	29	49	23.7	83	31	49	24.1	88	29	49	25.1	87	31	49	25.9	85
1,000	31	160	21.2	74	21	162	21.9	78	31	121	24.2	81	29	152	23.6	80	31	118	24.2	84	29	131	25.2	84	31	143	26.3	79
950	31	605	18.3	76	31	610	19.5	74	31	575	22.0	77	29	602	20.9	78	31	575	22.5	78	29	589	23.5	73	31	597	24.2	73
900	31	1,064	15.0	79	21	1,071	16.5	70	31	1,038	19.0	78	29	1,066	18.3	73	31	1,038	19.9	75	29	1,054	20.9	69	31	1,069	21.4	67
850	31	1,546	12.3	67	21	1,556	14.7	57	31	1,527	15.9	76	29	1,554	15.6	69	31	1,529	16.9	72	29	1,546	17.9	64	31	1,562	18.3	67
800	31	2,054	11.5	46	21	2,067	12.8		31	2,041	13.6	66	29	2,066	12.5	64	31	2,044	13.9	66	29	2,063	14.6	65	31	2,079	15.1	62
750	31	2,599	10.4	33	21	2,613	10.6		31	2,591	11.2	60	29	2,611	9.7	57	31	2,594	10.7	63	29	2,609	11.2	65	31	2,624	11.9	58
700	31	3,164	7.8		21	3,179	7.9		31	3,158	8.5	56	29	3,175	6.4	51	31	3,159	7.3	63	29	3,179	8.2	56	31	3,198	8.5	55
650	31	3,778	5.1		21	3,791	4.7		31	3,773	5.3	51	29	3,784	3.1	43	30	3,775	3.9	61	29	3,798	4.7	52	31	3,809	4.8	53
600	31	4,421	1.3		21	4,435	1.2		31	4,417	1.4	51	29	4,425	- .2	35	30	4,414	.2	56	29	4,437	1.0	51	31	4,455	1.1	47
550	31	5,113	- 3.4		21	5,132	- 3.0		31	5,114	- 2.5	48	29	5,115	- 3.9		29	5,106	- 3.2	50	29	5,135	- 3.2	51	31	5,154	- 2.7	45
500	31	5,862	- 8.6		21	5,877	- 8.1		31	5,863	- 7.0	45	28	5,863	- 8.3		29	5,857	- 7.6	47	29	5,881	- 7.7	49	31	5,900	- 7.2	43
450	31	6,679	-14.0		21	6,695	-14.1		31	6,690	-12.1	42	28	6,685	-13.8		29	6,681	-12.6	38	29	6,703	-12.7	48	31	6,723	-12.4	42
400	31	7,556	-20.4		21	7,570	-20.9		31	7,570	-18.0	40	28	7,558	-19.8		29	7,560	-18.9	39	29	7,584	-18.7	49	31	7,605	-18.0	42
350	31	8,531	-27.5		21	8,542	-28.3		31	8,554	-25.0	40	28	8,535	-27.3		28	8,543	-25.5	41	29	8,568	-25.2	47	31	8,590	-24.8	39
300	31	9,622	-35.8		21	9,629	-36.7		31	9,655	-33.5		27	9,626	-35.8		28	9,643	-33.9	42	28	9,669	-33.4	46	31	9,693	-33.1	34
250	31	10,863	-45.5		21	10,867	-45.2		31	10,908	-43.3		27	10,867	-45.7		26	10,893	-43.7		28	10,923	-43.4		29	10,950	-43.1	
200	31	12,315	-56.6		21	12,326	-54.0		31	12,373	-54.8		27	12,317	-56.7		26	12,357	-55.1		27	12,388	-54.5		29	12,416	-54.7	
175	31	13,150	-61.9		21	13,174	-58.0		31	13,214	-60.7		27	13,154	-61.3		26	13,197	-61.4		25	13,231	-60.5		29	13,258	-60.9	
150	30	14,101	-65.4		21	14,134	-63.3		30	14,161	-66.7		27	14,101	-65.2		25	14,139	-67.6		24	14,176	-66.4		29	14,201	-66.9	
125	27	15,201	-69.0		21	15,235	-70.2		30	15,248	-71.9		27	15,201	-68.7		23	15,228	-72.4		22	15,265	-71.1		27	15,293	-70.1	
100	24	16,518	-74.3		21	16,540	-76.6		25	16,553	-75.1		24	16,529	-72.4		19	16,526	-73.7		17	16,569	-72.5		25	16,614	-70.3	
80	14	17,795	-76.3		19	17,812	-77.9		19	17,858	-71.9		20	17,836	-74.1		16	17,835	-71.5		14	17,881	-69.4		21	17,941	-68.2	
60	8	19,474	-69.3		13	19,486	-73.2		16	19,588	-64.4		16	19,515	-70.2		15	19,562	-63.4		13	19,609	-63.4		20	19,688	-62.0	
50	6	20,576	-65.4		11	20,562	-67.3		14	20,712	-61.2		13	20,618	-64.2		14	20,691	-59.4		13	20,734	-60.6		17	20,823	-59.4	
40					9	21,932	-60.6		13	22,111	-57.7		12	21,999	-58.2		13	22,099	-56.3		13	22,135	-56.7		16	22,232	-55.9	
30					7	23,774	-52.8		7	23,937	-54.2		8	23,825	-53.6		7	23,923	-52.7		9	23,979	-52.2		11	24,066	-52.6	

Standard pressure surface (mb.)	[h] CAMAGUEY, CUBA (1002 MB.)				[h] HAVANA, CUBA (1011 MB.)				[h] MERIDA, MEXICO (1012 MB.)				[j] CAMAGUEY, CUBA (1000 MB.)				[j] HAVANA, CUBA (1008 MB.)				[j] TACUBAYA, MEXICO (773 MB.)				[k] CAMAGUEY, CUBA (1000 MB.)			
SURFACE	29	122	23.9	94	31	49	26.1	85	30	27	26.9	82	18	122	23.6	95	29	49	25.0	88	12	2,306	17.1		22	122	22.7	96
1,000	29	140	24.1	93	31	142	26.5	81	30	136	26.1	81	18	121	23.7	95	29	120	25.4	85	12	49			22	118	22.6	95
950	29	594	24.0	79	31	597	24.4	77	30	592	24.3	74	18	577	24.0	80	29	581	24.0	79	12	516			22	571	22.4	83
900	29	1,064	21.9	68	31	1,069	21.7	70	30	1,062	21.5	73	18	1,045	21.7	74	29	1,045	21.1	75	12	995			22	1,036	20.0	76
850	29	1,558	19.0	67	31	1,563	18.8	66	30	1,556	18.5	73	18	1,540	18.8	72	29	1,538	18.0	76	12	1,487			22	1,528	17.2	73
800	29	2,077	15.9	62	31	2,081	15.6	64	30	2,074	15.5	69	18	2,058	15.8	68	29	2,055	15.1	73	12	2,018			22	2,043	14.2	70
750	29	2,624	12.6	54	31	2,626	12.6	57	30	2,617	12.4	63	18	2,609	12.7	61	29	2,607	12.3	69	12	2,573	14.8		22	2,594	11.6	60
700	29	3,198	9.2	47	31	3,201	9.3	50	30	3,195	9.2	57	18	3,181	9.3	54	29	3,176	9.2	62	12	3,149	9.8		22	3,160	8.6	54
650	29	3,811	5.6	42	31	3,814	5.6	48	29	3,806	5.7	54	18	3,796	5.7	56	29	3,796	5.5	62	12	3,773	5.4		22	3,779	5.5	48
600	29	4,459	1.6	44	31	4,462	1.8	51	28	4,457	2.0	53	18	4,444	1.8	55	29	4,438	1.9	60	12	4,412	1.3		22	4,421	1.7	48
550	29	5,157	- 2.5	43	31	5,159	- 2.2	45	28	5,154	- 1.9	50	18	5,144	- 2.5		29	5,140	- 1.9	57	12	5,116	- 2.6		22	5,122	- 2.3	
500	29	5,906	- 7.0	43	31	5,910	- 6.6	41	28	5,906	- 6.2	44	18	5,890	- 6.8		29	5,888	- 6.2	53	11	5,858	- 6.5		22	5,867	- 6.6	
450	29	6,727	-12.3	43	31	6,737	-11.6	36	28	6,730	-11.4	48	18	6,714	-11.4		29	6,719	-10.8	50	11	6,687	-11.1		22	6,694	-12.0	
400	29	7,612	-17.8	38	31	7,619	-17.4	37	28	7,617	-17.2	52	18	7,601	-17.1		29	7,603	-16.7	47	11	7,571	-16.8		22	7,575	-17.9	
350	29	8,596	-24.5	38	31	8,607	-24.1	34	27	8,604	-23.7	47	17	8,586	-24.1		29	8,594	-23.4	42	11	8,560	-23.6		22	8,560	-24.7	
300	27	9,697	-32.8	40	31	9,713	-32.4		26	9,710	-32.2		17	9,692	-32.2		29	9,704	-31.7	37	9	9,658	-32.1		22	9,663	-33.0	
250	27	10,953	-42.9		29	10,972	-42.4		25	10,969	-42.4		17	10,952	-42.0		29	10,966	-42.0		6	10,918	-42.1		22	10,919	-42.8	
200	27	12,421	-54.1		26	12,446	-53.9		22	12,434	-55.0		17	12,422	-54.3		28	12,441	-53.9						22	12,388	-54.5	
175	27	13,264	-60.4		23	13,293	-60.3		20	13,277	-61.6		17	13,264	-61.2		27	13,284	-60.6						22	13,230	-61.1	
150	27	14,209	-66.5		23	14,238	-66.9		19	14,213	-68.0		16	14,205	-67.5		27	14,228	-67.1						20	14,170	-68.5	
125	27	15,300	-70.6		22	15,327	-71.4		13	15,300	-72.7		12	15,283	-72.7		20	15,314	-71.5						19	15,246	-73.7	
100	22	16,617	-71.8		15	16,644	-70.9		9	16,608	-73.8		11	16,583	-72.6		16	16,626	-72.2						16	16,539	-75.9	
80	20	17,938	-68.9		12	17,975	-68.2		5	17,911	-69.7		10	17,904	-67.8		13	17,943	-68.4						13	17,848	-69.6	
60	18	19,680	-63.7		11	19,720	-61.8						9	19,649	-62.9		12	19,696	-62.1						13	19,594	-63.9	
50	17	20,807	-60.1		11	20,852	-59.4						7	20,774	-60.6		12	20,827	-60.0						12	20,716	-61.6	
40	13	22,213	-57.4		10	22,262	-56.8						6	22,174	-57.7		9	22,218	-58.3						11	22,108	-58.9	
30	6	24,062	-53.0										5	24,012	-55.2										7	23,928	-56.2	

Standard pressure surface (mb.)	[k] HAVANA, CUBA (1009 MB.)				[k] HILO, T. H. (1014 MB.)				[k] MERIDA, MEXICO (1012 MB.)				[k] TACUBAYA, MEXICO (774 MB.)				[l] CAMAGUEY, CUBA (1001 MB.)				[l] HAVANA, CUBA (1011 MB.)				[m] CAMAGUEY, CUBA (1003 MB.)			
SURFACE	31	49	24.4	83	31	9	25.9	71	29	27	24.9	80	29	2,306	15.3	69	27	122	21.0	95	26	49	22.0	81	14	122	18.7	
1,000	31	125	24.6	79	31	132	24.1	70	29	134	24.3	80	29	66			27	132	21.1	95	26	143	22.3	75	14	149	19.0	
950	31	583	22.2	76	31	584	20.2	78	29	584	22.0	77	29	529			27	586	21.3	80	26	593	19.6	75	14	596	18.8	
900	31	1,044	19.1	76	31	1,045	16.7	82	29	1,051	19.0	75	29	1,006			27	1,047	18.7	77	26	1,052	16.5	73	14	1,053	16.7	
850	31	1,534	16.3	73	31	1,530	13.8	81	29	1,541	16.2	71	29	1,495			27	1,536	15.9	75	26	1,537	13.8	65	13	1,539	14.0	
800	31	2,048	13.9	65	31	2,040	11.7	69	29	2,055	13.6	64	29	2,022			27	2,048	12.8	71	26	2,045	11.4	55	13	2,048	11.9	
750	31	2,598	11.6	46	31	2,589	10.2	46	29	2,603	11.5	49	29	2,572	13.6	68	27	2,600	10.2	60	26	2,594	9.7	41	13	2,596	9.1	
700	31	3,165	8.4	43	31	3,151	8.4	24	29	3,171	9.0	42	29	3,145	9.2	73	27	3,160	7.2	56	26	3,154	6.9	37	13	3,154	6.9	
650	31	3,783	5.2	36	31	3,768	5.4		29	3,786	5.4	43	29	3,763	4.9	78	27	3,775	3.8	45	26	3,768	3.5		12	3,768	4.2	
600	31	4,424	1.5		31	4,410	1.9		29	4,432	1.8	41	29	4,405	.6	79	27	4,413	.4	41	26	4,405	- .3		12	4,409	.4	
550	30	5,120	- 2.8	31	31	5,107	- 2.6		27	5,127	- 2.5	39	27	5,105	- 2.8	70	27	5,110	- 3.5	37	26	5,102	- 4.5		12	5,103	- 3.4	
500	30	5,870	- 7.4	31	30	5,856	- 7.4		27	5,879	- 7.0	38	26	5,853	- 6.9	58	27	5,854	- 7.8		26	5,840	- 9.5		12	5,849	- 8.5	
450	30	6,698	-12.8	35	30	6,680	-13.4		27	6,700	-12.4		25	6,676	-11.9		27	6,680	-12.9		26	6,665	-14.9		12	6,673	-13.9	
400	30	7,572	-18.9	36	30	7,553	-20.5		27	7,583	-18.5		25	7,561	-17.9		27	7,555	-19.2	33	26	7,530	-20.5		12	7,545	-20.5	
350	30	8,553	-25.9	40	30	8,525	-27.8		27	8,564	-25.4		19	8,546	-25.0		27	8,535	-26.1		26	8,505	-27.5		11	8,519	-27.7	
300	30	9,651	-34.0	38	30	9,614	-36.0		25	9,661	-33.9		14	9,648	-34.0		27	9,631	-34.5		26	9,595	-35.7		11	9,609	-35.9	
250	29	10,902	-43.6		30	10,853	-45.5		25	10,910	-43.9		12	10,894	-44.3		27	10,879	-44.1		26	10,838	-45.3		10	10,841	-44.8	
200	29	12,366	-55.0		30	12,304	-56.5		24	12,366	-55.7		11	12,352	-56.3		27	12,340	-54.9		25	12,296	-55.7		10	12,297	-55.3	
175	29	13,207	-61.4		30	13,139	-62.1		23	13,201	-62.2		10	13,183	-63.2		26	13,182	-60.7		25	13,136	-60.9		10	13,141	-59.9	
150	28	14,151	-67.3		29	14,079	-66.9		22	14,132	-69.0		8	14,117	-70.1		25	14,126	-66.5		24	14,081	-66.1		10	14,092	-65.6	
125	28	15,236	-71.7		25	15,166	-71.9		16	15,203	-74.6		8	15,189	-74.5		23	15,219	-71.0		23	15,174	-70.4		10	15,185	-71.1	
100	24	16,540	-74.0		19	16,474	-73.8		12	16,498	-75.8						18	16,522	-75.7		15	16,489	-74.7		10	16,488	-76.0	
80	16	17,848	-69.0		6	17,804	-71.3		9	17,794	-70.1						14	17,806	-74.7		12	17,783	-72.8		9	17,783	-75.4	
60	14	19,599	-63.4						7	19,528	-63.8						13	19,511	-66.8		12	19,499	-66.5		8	19,481	-65.9	
50	13	20,723	-61.2						7	20,653	-60.7						12	20,611	-62.8		11	20,613	-62.1		7	20,593	-63.8	
40	6	22,121	-59.0						6	22,044	-58.4						9	21,981	-60.4		10	21,994	-59.7		7	21,973	-61.4	
30																	5	23,778	-58.4		9	23,803	-57.7		6	23,772	-59.4	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

Standard pressure surface (mb.)	[m] HAVANA, CUBA (1012 MB.)				[m] MERIDA, MEXICO (1016 MB.)				[m] TACUBAYA, MEXICO (776 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	17	49	20.0	79	31	27	22.3	74	13	2,306	14.2	
1,000--	17	156	20.0	76	31	163	21.6	73	13	91		
950----	17	602	17.5	76	31	608	18.9	71	13	553		
900----	17	1,058	14.4	81	31	1,069	16.0	71	13	1,029		
850----	17	1,539	11.6	76	31	1,553	12.7	74	13	1,516		
800----	17	2,045	10.6		31	2,060	10.4	65	13	2,044		
750----	17	2,594	8.4		31	2,603	9.5	40	13	2,593	13.1	
700----	17	3,149	6.3		31	3,167	7.5		13	3,165	9.0	
650----	17	3,760	3.5		31	3,780	4.7		13	3,780	4.5	
600----	17	4,399	- .1		31	4,422	1.1		13	4,422	.3	
550----	17	5,092	- 4.7		31	5,115	- 3.4		12	5,114	- 3.1	
500----	17	5,834	- 9.3		31	5,863	- 8.2		11	5,863	- 7.9	
450----	17	6,656	-14.7		31	6,681	-13.8		9	6,677	-13.8	
400----	17	7,524	-21.3		31	7,557	-20.4		6	7,557	-20.0	
350----	17	8,494	-28.9		30	8,529	-28.3		5	8,541	-27.3	
300----	17	9,579	-37.2		30	9,613	-36.8					
250----	17	10,812	-47.1		28	10,841	-46.7					
200----	17	12,256	-57.4		28	12,286	-56.9					
175----	17	13,091	-61.7		28	13,119	-61.8					
150----	17	14,041	-64.3		27	14,061	-66.5					
125----	16	15,144	-68.5		23	15,149	-71.2					
100----	15	16,465	-72.7		18	16,452	-75.9					
80-----	15	17,770	-74.2		8	17,737	-77.9					
60-----	13	19,470	-68.6		7	19,392	-69.1					
50-----	12	20,569	-65.0		7	20,487	-67.1					
40-----	11	21,940	-62.0									
30-----	8	23,732	-59.1									

a December 1952
b February 1953
c October 1953
d April 1954
e May 1954
f June 1954
g July 1954
h August 1954
j September 1954
k October 1954
l November 1954
m December 1954

Also see footnotes with current data.

CORRECTIONS

	Month: January 1954
page 3: Rogers Pass, Montana	The lowest temperature should be -70°F.
	Month: August 1954
page 294: Idaho Falls 46W CO, Idaho	Temperature departure from normal should be -3.1°F, and precipitation departure from normal should be -0.25 inches.
page 298: Devils Lake (CO), N. D.	Number of heating degree days for July through this month, September page 344, October page 372, and November page 423, should be 86, 417, 1075, and 2019, respectively.
Burlington, Vermont	Number of heating degree days for July through this month, September page 344, October page 372, and November page 423, should be 84, 308, 735 and 1534, respectively.
page 325: Table 20, Radiosonde Data	Reprinted on page 468 of this issue, December 1954, showing corrected relative humidity data; also on page 405, October issue.
	Month: November 1954
page 423: Denver Col.	Number of heating degree days for July through this month should be 1086.

RADIOSONDE DATA

Average monthly values

Table 20 Reprinted from the August 1954 issue with corrected Relative Humidity Data

Standard pressure surface (mb.)	ALBUQUERQUE, N. MEX. (840 MB.)				ATLANTA, GA. (983 MB.)				BISMARCK, N. DAK. (955 MB.)				BOISE, IDAHO (912 MB.)				BROWNSVILLE, TEX. (1013 MB.)				BUFFALO, N. Y. (993 MB.)				BURRWOOD, LA. (1016 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,619	24.3	42	31	309	26.3	68	31	505	19.7	73	31	868	22.6	38	31	7	27.7	81	30	221	18.1	82	31	3	28.0	79
1000---	31	48			31	154			31	105			31	59			31	126	27.0	79	30	122			31	146	27.3	77
950----	31	518			31	612	26.9	55	31	555	20.5	66	31	517			31	583	24.5	74	30	566	18.5	65	31	603	24.7	68
900----	31	1,006			31	1,088	24.0	56	31	1,020	19.6	55	31	987	24.3	27	31	1,053	22.5	60	30	1,026	15.2	71	31	1,073	22.0	64
850----	31	1,509			31	1,585	20.1	59	31	1,509	16.4	57	31	1,484	21.5	26	31	1,549	20.2	52	30	1,508	11.9	71	31	1,567	19.2	59
800----	31	2,041	22.2	38	31	2,105	16.2	62	31	2,023	13.5	55	31	2,004	17.0	29	31	2,070	17.4	49	30	2,013	9.1	67	31	2,087	16.1	52
750----	31	2,602	18.0	41	31	2,655	12.4	61	31	2,568	10.2	52	31	2,555	12.4	34	31	2,623	14.3	45	30	2,551	6.3	59	31	2,635	12.9	48
700----	31	3,184	13.2	47	31	3,227	8.7	57	31	3,134	6.2	52	31	3,124	7.5	39	31	3,197	10.7	40	30	3,109	3.4	55	31	3,209	9.5	43
650----	31	3,805	8.1	56	31	3,844	5.1	56	31	3,741	2.0	51	31	3,731	2.7	44	31	3,816	6.9	40	29	3,712	.4	47	31	3,821	5.9	42
600----	31	4,458	2.7	63	31	4,487	1.4	53	31	4,377	- 2.3	47	31	4,371	- 2.4	46	31	4,465	3.0	41	29	4,346	- 3.1	41	31	4,471	2.1	42
550----	31	5,156	- 2.4	66	31	5,187	- 2.3	46	31	5,064	- 6.5	41	31	5,057	- 7.5	45	31	5,169	- 1.2	39	29	5,032	- 6.9		31	5,174	- 2.0	42
500----	31	5,907	- 7.2	64	31	5,934	- 6.7	40	31	5,801	-11.5	37	31	5,791	-12.7	38	31	5,919	- 5.8	38	29	5,768	-11.5		31	5,920	- 6.6	37
450----	31	6,732	-12.0	51	30	6,759	-12.1	34	31	6,608	-17.2	38	31	6,595	-18.6	33	31	6,749	-11.1	34	29	6,577	-16.7		31	6,749	-12.0	38
400----	31	7,615	-17.6	45	29	7,638	-18.1	32	31	7,473	-23.5	39	31	7,454	-24.8		31	7,631	-17.2	35	29	7,444	-22.8		31	7,626	-18.1	34
350----	31	8,600	-24.2	38	29	8,621	-25.1		31	8,435	-30.7	39	31	8,411	-32.0		31	8,618	-24.4		29	8,409	-29.9		31	8,609	-25.3	
300----	31	9,705	-32.5	35	29	9,720	-33.8		30	9,510	-39.0		31	9,481	-40.0		31	9,722	-32.8		29	9,488	-38.0		31	9,709	-33.7	
250----	31	10,962	-42.3		28	10,972	-43.4		30	10,735	-48.1		31	10,703	-47.9		31	10,979	-42.8		29	10,719	-46.7		31	10,961	-43.3	
200----	31	12,433	-53.5		28	12,435	-54.7		30	12,179	-54.7		31	12,159	-52.0		31	12,448	-54.3		29	12,174	-54.0		31	12,426	-54.2	
175----	31	13,280	-59.4		28	13,278	-60.1		30	13,031	-55.4		30	13,025	-53.8		31	13,292	-60.1		29	13,025	-56.5		31	13,269	-59.9	
150----	29	14,231	-65.3		28	14,226	-65.2		30	14,009	-56.7		29	14,016	-54.5		31	14,240	-65.8		26	13,985	-58.6		31	14,220	-64.8	
125----	28	15,330	-69.2		27	15,326	-68.7		30	15,159	-58.8		27	15,182	-56.4		29	15,335	-70.3		18	15,114	-59.8		29	15,318	-69.2	
100----	24	16,658	-69.2		26	16,660	-67.4		29	16,556	-59.4		26	16,589	-57.6		28	16,655	-71.7		8	16,523	-60.8		29	16,644	-69.7	
80-----	21	18,005	-63.8		25	18,016	-63.7		29	17,956	-57.8		22	17,999	-56.9		24	17,978	-68.5						28	17,981	-66.8	
60-----	20	19,792	-58.1		24	19,799	-59.5		28	19,781	-55.0		21	19,833	-53.5		20	19,732	-62.1						23	19,742	-61.7	
50-----	20	20,946	-56.0		23	20,945	-57.6		27	20,950	-53.5		19	21,010	-52.8		19	20,868	-58.7						21	20,877	-59.4	
40-----	18	22,367	-53.7		21	22,358	-55.3		25	22,388	-51.8		15	22,454	-50.9		17	22,274	-56.0						11	22,286	-56.5	
30-----	12	24,219	-51.7		17	24,214	-51.7		22	24,267	-49.0		9	24,319	-49.2		13	24,116	-52.7									
20-----					5	26,873	-48.1		11	26,928	-47.0																	
15-----									5	28,823	-46.3																	

Standard pressure surface (mb.)	CARIBOU, ME. (989 MB.)				CHARLESTON, S. C. (1015 MB.)				COLUMBIA, MO. (987 MB.)				DODGE CITY, KANS. (923 MB.)				EL PASO, TEX. (882 MB.)				ELY, NEV. (809 MB.)				GLASGOW, MONT. (938 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	191	13.9	86	31	13	25.2	86	31	238	25.4	70	31	792	27.1	50	31	1,195	27.6	45	31	1,908	20.5	25	31	648	20.3	61
1000---	31	94			31	145	26.5	79	31	117			31	72			31	59			31	26			31	86		
950----	31	531	15.4	65	31	605	25.0	67	31	578	26.3	59	31	535			31	528			31	495			31	538		
900----	31	987	12.6	65	31	1,073	22.4	62	31	1,048	23.6	58	31	1,015	27.6	44	31	1,012			31	978			31	1,004	19.9	52
850----	31	1,464	9.2	66	31	1,568	18.9	67	31	1,545	20.4	62	31	1,519	24.5	45	31	1,517	25.6	44	31	1,475			31	1,494	16.8	51
800----	31	1,964	5.7	69	31	2,086	15.4	63	31	2,067	17.0	61	31	2,048	20.7	49	31	2,047	21.3	48	31	2,004	22.6	19	31	2,007	13.2	52
750----	31	2,494	2.6	64	31	2,638	12.2	58	31	2,619	13.1	62	31	2,606	16.3	53	31	2,605	16.6	55	31	2,564	18.5	20	31	2,565	9.4	51
700----	31	3,044	- .4	58	31	3,206	8.8	59	31	3,191	9.0	62	31	3,185	11.8	53	31	3,186	11.8	60	31	3,146	13.1	24	30	3,116	5.4	50
650----	31	3,638	- 3.2	48	31	3,821	5.2	58	31	3,808	5.1	58	31	3,804	7.1	54	31	3,805	6.8	65	31	3,764	7.3	30	30	3,722	1.1	51
600----	31	4,263	- 6.7	42	31	4,465	1.6	51	31	4,451	1.2	55	30	4,455	2.6	51	31	4,455	2.0	66	31	4,414	1.2	38	29	4,357	- 3.4	52
550----	31	4,940	-10.1	36	31	5,164	- 2.4	45	31	5,151	- 3.0	50	30	5,156	- 1.8	43	31	5,153	- 2.5	59	31	5,108	- 4.9	45	29	5,041	- 8.2	47
500----	31	5,667	-14.6	32	31	5,911	- 6.8	38	31	5,895	- 7.6	44	30	5,905	- 6.6	42	31	5,902	- 7.0	56	31	5,849	-10.8	46	29	5,773	-13.3	45
450----	31	6,467	-20.1	35	31	6,740	-11.6	35	31	6,719	-12.8	33	30	6,732	-11.9	34	31	6,729	-11.8	52	31	6,663	-15.8	34	29	6,575	-18.5	42
400----	31	7,319	-26.1	37	31	7,620	-17.4	34	31	7,596	-19.0		30	7,612	-17.8	35	31	7,610	-17.6	43	31	7,531	-21.7		29	7,436	-24.6	41
350----	31	8,271	-33.2		31	8,605	-24.6		30	8,574	-26.5		30	8,597	-24.6		30	8,597	-24.2	35	31	8,501	-28.9		29	8,392	-32.1	39
300----	31	9,335	-41.0		31	9,707	-33.1		30	9,669	-34.7		30	9,700	-32.8		30	9,701	-32.8		31	9,586	-37.0		29	9,460	-40.7	
250----	31	10,551	-48.8		30	10,961	-43.2		30	10,916	-44.2		29	10,955	-42.6		29	10,956	-42.9		31	10,822	-46.0		29	10,674	-50.0	
200----	31	12,002	-51.5		30	12,426	-54.4		30	12,377	-54.8		28	12,424	-53.7		29	12,421	-54.9		31	12,280	-53.9		28	12,102	-55.5	
175----	31	12,868	-51.9		30	13,269	-60.2		29	13,222	-60.0		27	13,269	-59.2		29	13,262	-60.9		30	13,128	-56.9		28	12,955	-54.2	
150----	31	13,863	-53.0		30	14,217	-65.2		29	14,173	-64.3		27	14,221	-64.4		28	14,204	-67.1		30	14,098	-59.8		28	13,943	-54.4	
125----	31	15,035	-54.0		29	15,319	-68.7		29	15,278	-67.2		25	15,322	-68.1		28	15,289	-71.5		30	15,230	-62.1		28	15,105	-56.3	
100----	31	16,465	-54.0		28	16,653	-68.3		26	16,619	-66.3		23	16,659	-68.1		25	16,608	-70.4		29	16,608	-62.7		26	16,515	-57.3	
80-----	31	17,899	-53.1		27	18,003	-64.4		22	17,979	-63.1		19	18,007	-63.5		22	17,949	-65.2		28	17,985	-60.5		25	17,930	-55.8	
60-----	27	19,758	-51.4		23	19,783	-59.5		20	19,770	-58.7		16	19,795	-58.3		20	19,730	-58.6		25	19,795	-56.3		23	19,768	-53.8	
50-----	26	20,944	-50.7		21	20,927	-57.8		20	20,923	-55.2		16	20,945	-56.2		20	20,879	-57.1		25	20,957	-55.0		21	20,937	-52.8	
40-----	24	22,399	-49.7		21	22,340	-55.5		20	22,351	-53.5		14	22,367	-53.7		14	22,296	-54.4		24	22,392	-52.6		16	22,380	-51.4	
30-----	23	24,281	-48.6		16	24,184	-53.0		19	24,214	-50.6		10	24,232	-51.3		9	24,154	-51.2		21	24,248	-50.7		10	24,246	-49.6	
20-----	12	26,968	-46.8						12	26,854	-46.9																	

Standard pressure surface (mb.)	GRAND JUNCTION, COLO. (852 MB.)				GREAT FALLS, MONT. (887 MB.)				GREEN BAY, WIS. (992 MB.)				GREENSBORO, N. C. (986 MB.)				HATTERAS, N. C. (1015 MB.)				HAVANA, CUBA (1011 MB.)				HILO, T. H. (1014 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,474	25.0	28	31	1,122	19.1	53	31	210	17.4	82	30	273	22.4	83	31	3	25.9	80	31	49	26.1	85	30	9	26.1	77
1000---	31	34			31	74			31	133			30	146			31	132	25.5	76	31	142	26.5	81	30	130	23.1	75
950----	31	506			31	534			31	578	18.5	64	30	600	24.4	61	31	585	23.3	70	31	597	24.4	77	30	579	19.9	79
900----	31	991			31	1,004			31	1,038	15.8	64	30	1,068	21.7	60	31	1,054	20.5	66	31	1,069	21.7	70	30	1,041	16.7	83
850----	31	1,490	25.4	28	31	1,489	18.0	44	31	1,521	12.7	62	30	1,562	18.3	64	31	1,547	17.4	64	31	1,563	18.8	66	30	1,526	13.6	86
800----	31	2,022	23.9	24	31	2,005	14.4	49	31	2,027	9.8	60	30	2,079	14.6	67	31	2,062	14.5	55	31	2,081	15.6	64	30	2,036	12.1	72
750----	31	2,586	19.2	27	31	2,554	10.3	54	31	2,568	7.3	51	30	2,629	11.2	65	31	2,610	11.4	53	31	2,626	12.6	57	30	2,587	10.9	47
700----	31	3,168	13.9	32	31	3,117	5.8	60	31	3,126	4.3	48	30	3,195	7.9	59	31	3,179	8.1	51	31	3,201	9.3	50	30	3,151	8.5	41
650----	31	3,790	8.2	39	31	3,724	1.1	65	31	3,728	1.1	41	30	3,812	4.5	53	31	3,792	4.7	47	31	3,814	5.6	48	30	3,766	5.3	33
600----	31	4,441	2.5	47	31	4,358	- 3.7	67	31	4,366	- 2.4	37	30	4,452	1.0	48	31	4,435	1.0	43	31	4,462	1.8	51	29	4,411	2.0	
550----	31	5,137	- 3.1	53	31	5,044	- 8.4	63	31	5,053	- 6.6	35	30	5,154	- 2.8	42	31	5,134	- 3.0	44	31	5,159	- 2.2	45	29	5,108	- 1.8	
500----	31	5,886	- 8.3	43	31	5,772	-13.6	59	31	5,790	-10.9	32	30	5,897	- 7.0	42	31	5,878	- 7.1	42	31	5,910	- 6.6	41	29	5,860	- 6.4	
450----	31	6,705	-13.9	37	31	6,575	-19.4	54	31	6,599	-16.3		30	6,726	-12.2	43	31	6,705	-12.1	39	31	6,737	-11.6	36	29	6,690	-11.7	
400----	31	7,579	-20.0		31	7,430	-25.7	49	31	7,468	-22.4		30	7,603	-18.2	40	31	7,583	-17.9	36	31	7,619	-17.4	37	29	7,568	-17.7	
350----	30	8,552	-27.2		31	8,382	-33.1	47	31	8,435	-29.3		30	8,586	-24.9	34	31	8,567	-25.2	37	31	8,607	-24.1	34	29	8,552	-25.2	
300----	30	9,643	-35.4		31	9,446	-41.3		31	9,516	-37.6		30	9,687	-33.2	34	31	9,668	-33.5	37	31	9,713	-32.4		29	9,650	-34.2	
250----	30	10,886	-44.3		31	10,658	-50.3		31	10,749	-46.4		30	10,942	-42.6		29	10,920	-43.3		29	10,972	-42.4		29	10,897	-44.5	
200----	30	12,351	-53.5		31	12,094	-55.3		31	12,206	-52.9		30	12,413	-53.4		29	12,386	-54.1		26	12,446	-53.9		29	12,351	-56.5	
175----	30	13,200	-58.0		31	12,946	-54.4		30	13,058	-55.8		30	13,261	-58.9		29	13,232	-59.5		23	13,293	-60.3		28	13,185	-63.0	
150----	30	14,160	-62.1		31	13,934	-54.4		30	14,033	-58.3		28	14,217	-63.3		28	14,183	-64.9		23	14,238	-66.9		28	14,118	-69.2	
125----	30	15,277	-65.4		31	15,097	-56.3		28	15,172	-60.1		28	15,328	-66.1		28	15,285	-67.9		22	15,327	-71.4		28	15,194	-72.5	
100----	25	16,625	-65.4		31	16,508	-57.7		28	16,562	-60.1		28	16,681	-65.3		25	16,624	-66.7		15	16,644	-70.9		28	16,500	-72.6	
80-----	23	17,993	-61.0		31	17,919	-56.3		27	17,955	-58.3		25	18,048	-62.5		25	17,983	-62.7		12	17,975	-68.2		27	17,819	-69.4	
60-----	21	19,799	-56.3		29	19,751	-54.5		26	19,777	-55.0		21	19,845	-57.2		24	19,780	-57.8		11	19,720	-61.8		26	19,559	-64.2	
50-----	20	20,959	-54.6		27	20,918	-53.4		26	20,947	-52.9		21	21,003	-55.1		22	20,931	-56.5		11	20,852	-59.4		22	20,682	-60.7	
40-----	20	22,395	-52.2		27	22,358	-51.7		26	22,393	-51.0		21	22,433	-53.3		19	22,358	-54.3		10	22,262	-56.8		21	22,073	-59.2	
30-----	11	24,262	-50.2		22	24,238	-48.9		19	24,287	-49.0		17	24,300	-50.5		11	24,216	-51.9						11	23,875	-56.8	
20-----					9	26,914	-45.7		5	26,937	-47.3		6	26,929	-47.8													

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

Table 20—Continued

RADIOSONDE DATA

Average monthly values

Standard pressure surface (mb)	INTERNAT. FALLS, MINN. (973 MB.)				LAKE CHARLES, LA. (1016 MB.)				LANDER, WYO. (829 MB.)				LAS VEGAS, NEV. (933 MB.)				LITTLE ROCK, ARK. (1005 MB.)				MAZATLAN, MEXICO (1010 MB.)				MEDFORD, ORE. (967 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	360	15.6	80	31	5	26.1	83	29	1,696	22.0	27	31	660	32.7	14	31	79	29.3	57	12	14	29.1		31	401	22.3	46
1000---	31	124			31	142	26.7	75	29	31			31	27			31	123	29.8	54	12	102	28.2		31	110		
950----	31	563	17.3	70	31	597	25.0	68	29	497			31	499			31	590	29.6	48	12	568	25.1		31	562	21.4	45
900----	31	1,023	14.3	69	31	1,069	22.6	60	29	978			31	983	32.1		31	1,063	26.2	50	12	1,032	22.6		31	1,022	17.8	51
850----	31	1,503	11.0	70	31	1,564	19.7	56	29	1,479			31	1,492	27.5	17	31	1,565	22.1	57	12	1,528	19.6		31	1,508	14.0	57
800----	31	2,006	8.4	62	31	2,084	16.8	51	29	2,008	22.4	20	31	2,023	22.6	19	31	2,089	17.9	62	12	2,049	17.0		31	2,016	10.2	62
750----	31	2,543	5.6	58	31	2,634	13.5	51	29	2,564	17.3	23	31	2,585	17.4	24	31	2,644	14.0	57	12	2,603	13.9		31	2,558	7.0	57
700----	30	3,101	2.5	54	31	3,209	10.0	45	29	3,146	12.0	27	31	3,162	12.0	29	31	3,216	10.2	53	12	3,177	10.6		31	3,115	3.8	46
650----	30	3,698	- .5	48	30	3,819	6.2	44	29	3,761	6.4	34	31	3,782	6.7	35	31	3,837	6.4	51	11	3,795	6.4		31	3,715	.2	38
600----	30	4,333	- 4.0	40	30	4,472	2.3	43	29	4,409	.7	39	31	4,429	2.3		31	4,482	2.5	49	10	4,448	2.4		31	4,349	- 3.9	33
550----	29	5,013	- 8.1	38	30	5,173	- 1.8	41	25	5,096	- 5.0	42	31	5,126	- 2.5		30	5,188	- 1.2	38	9	5,158	- 1.7		31	5,030	- 8.5	32
500----	29	5,747	-12.8		30	5,922	- 6.3	37	29	5,840	-10.9	42	30	5,875	- 7.6		30	5,934	- 5.8	36	8	5,900	- 6.3		31	5,762	-13.5	36
450----	29	6,547	-18.3		29	6,749	-11.6	33	29	6,647	-16.8	35	29	6,697	-13.4		30	6,766	-11.1	33	8	6,730	-11.3		31	6,563	-19.2	35
400----	29	7,410	-24.5		28	7,631	-17.5		29	7,514	-23.3		29	7,573	-19.7		30	7,647	-16.9		6	7,612	-16.2		31	7,420	-25.3	37
350----	29	8,368	-31.9		26	8,615	-24.8		28	8,477	-30.4		29	8,549	-27.5		30	8,634	-24.1		6	8,602	-23.5		31	8,375	-32.6	
300----	29	9,437	-40.1		24	9,715	-33.1		27	9,553	-39.0		28	9,638	-36.0		30	9,740	-32.6						31	9,443	-40.8	
250----	29	10,656	-48.8		24	10,969	-43.0		26	10,774	-47.9		28	10,878	-45.4		28	11,000	-42.2						30	10,666	-48.4	
200----	29	12,103	-53.2		23	12,431	-54.7		26	12,220	-54.6		28	12,334	-54.7		28	12,473	-53.4						30	12,119	-52.4	
175----	29	12,961	-53.7		18	13,270	-60.8		25	13,073	-56.1		28	13,179	-59.0		28	13,320	-59.0						30	12,980	-53.1	
150----	29	13,948	-55.1		16	14,220	-65.9		25	14,045	-58.9		26	14,137	-62.9		27	14,272	-64.7						30	13,971	-54.2	
125----	29	15,108	-56.4		15	15,317	-69.5		24	15,179	-61.7		21	15,256	-65.9		27	15,372	-68.8						28	15,139	-55.7	
100----	28	16,520	-57.2		11	16,645	-69.8		24	16,557	-62.0		8	16,590	-67.2		26	16,705	-68.5						24	16,555	-57.1	
80-----	28	17,930	-56.7		10	17,983	-67.4		23	17,938	-59.3						24	18,051	-64.8						20	17,963	-56.9	
60-----	24	19,767	-54.3		9	19,735	-62.3		21	19,760	-55.7						21	19,827	-58.8						17	19,792	-54.3	
50-----	24	20,939	-52.9		8	20,870	-58.5		21	20,925	-54.2						21	20,978	-56.3						16	20,967	-53.1	
40-----	23	22,385	-51.2		7	22,283	-55.8		15	22,345	-52.5						18	22,404	-53.6						15	22,410	-51.6	
30-----	21	24,262	-49.1						10	24,212	-50.2						13	24,250	-50.9						11	24,284	-49.5	
20-----	10	26,927	-46.4						5	26,842	-48.0																	
15-----	5	28,824	-45.4																									

Standard pressure surface (mb)	MERIDA, MEXICO (1012 MB.)				MIAMI, FLA. (1016 MB.)				MIDLAND, TEX. (916 MB.)				NANTUCKET, MASS. (1013 MB.)				NASHVILLE, TENN. (996 MB.)				NORTH PLATTE, NEBR. (916 MB.)				OAKLAND, CALIF. (1014 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	27	26.9	82	31	4	27.9	76	31	871	28.0	49	31	14	18.0	90	31	177	26.8	67	31	848	22.4	76	31	6	15.5	78
1000---	30	136	26.1	81	31	147	27.2	74	31	78			31	121	19.1	82	31	140			31	75			31	127	14.2	79
950----	30	592	24.3	74	31	601	24.3	73	31	542			31	565	18.6	65	31	600	26.6	53	31	534			31	571	15.5	67
900----	30	1,062	21.5	73	31	1,073	21.3	72	31	1,025	27.8	46	31	1,026	15.6	67	31	1,071	23.4	56	31	1,004	23.8	64	31	1,028	17.8	39
850----	30	1,556	18.5	73	31	1,566	18.3	68	31	1,530	24.3	50	31	1,509	13.0	61	31	1,568	19.7	61	31	1,504	21.8	57	31	1,510	16.3	30
800----	30	2,074	15.5	69	31	2,084	15.3	62	31	2,058	20.2	57	31	2,016	10.3	55	31	2,087	16.0	60	31	2,028	18.8	54	31	2,023	13.8	
750----	30	2,617	12.4	63	31	2,630	12.1	58	31	2,613	15.9	62	31	2,557	7.4	56	31	2,638	12.3	61	31	2,584	15.2	51	31	2,572	11.0	
700----	30	3,195	9.2	57	31	3,203	8.8	56	31	3,195	11.9	61	31	3,116	4.3	52	31	3,208	8.9	56	31	3,160	10.9	47	30	3,134	7.7	
650----	29	3,806	5.7	54	31	3,814	5.1	56	31	3,814	7.6	59	31	3,718	1.1	46	31	3,825	5.0	56	31	3,777	6.6	42	30	3,741	4.1	
600----	28	4,457	2.0	53	31	4,461	1.3	54	31	4,467	3.4	55	31	4,356	- 2.4	38	31	4,467	1.0	55	31	4,426	1.7	41	30	4,386	- .2	
550----	28	5,154	- 1.9	50	31	5,160	- 2.9	50	31	5,174	- 1.0	51	31	5,045	- 5.8	32	31	5,166	- 2.7	47	31	5,121	- 3.3	41	30	5,077	- 4.8	
500----	28	5,906	- 6.2	44	31	5,905	- 7.1	43	31	5,923	- 5.3	45	31	5,783	-10.4	32	31	5,912	- 6.8	41	31	5,868	- 8.5	41	30	5,818	-10.3	
450----	28	6,730	-11.4	48	30	6,732	-12.1	38	30	6,762	-10.4	33	31	6,593	-15.8	36	31	6,738	-11.8	35	30	6,686	-13.9	41	30	6,629	-16.2	
400----	28	7,617	-17.2	52	30	7,610	-18.0	40	30	7,641	-16.3	31	31	7,465	-21.4		31	7,619	-17.7	31	29	7,566	-19.8		30	7,496	-22.7	
350----	27	8,604	-23.7	47	30	6,594	-24.8	38	29	8,631	-23.3	33	31	8,436	-28.4	37	31	8,605	-24.8		29	8,542	-27.0		30	8,460	-30.2	
300----	26	9,710	-32.2		30	9,697	-33.1	37	28	9,740	-31.7		31	9,522	-36.3		30	9,709	-32.9		28	9,636	-35.1		30	9,539	-38.2	
250----	25	10,969	-42.4		30	10,952	-43.0		28	11,001	-41.6		31	10,763	-44.8		30	10,965	-42.6		26	10,881	-44.6		29	10,773	-46.9	
200----	22	12,434	-55.0		29	12,419	-54.5		27	12,475	-52.8		31	12,225	-53.2		29	12,436	-53.5		25	12,344	-54.3		29	12,225	-54.0	
175----	20	13,277	-61.6		28	13,264	-60.3		26	13,325	-58.3		31	13,079	-56.2		29	13,284	-59.0		24	13,189	-59.1		28	13,076	-55.8	
150----	19	14,213	-68.0		27	14,214	-66.0		26	14,282	-63.8		31	14,050	-58.8		29	14,238	-64.2		24	14,145	-63.3		28	14,050	-57.8	
125----	13	15,300	-72.7		23	15,305	-70.6		21	15,388	-68.7		31	15,189	-60.7		29	15,345	-66.8		24	15,256	-66.4		27	15,194	-60.0	
100----	9	16,608	-73.8		21	16,625	-70.6		20	16,715	-69.7		30	16,576	-60.2		27	16,691	-66.5		20	16,605	-66.8		27	16,577	-61.9	
80-----	5	17,911	-69.7		21	17,959	-66.7		19	18,057	-65.0		27	17,975	-57.7		26	18,051	-63.6		18	17,971	-62.0		27	17,961	-60.3	
60-----					21	19,719	-61.5		19	19,838	-58.5		23	19,802	-54.3		22	19,838	-57.4		18	19,765	-58.3		26	19,769	-56.8	
50-----					21	20,854	-59.1		17	20,989	-56.3		21	20,975	-52.8		22	20,994	-55.5		17	20,918	-56.1		22	20,925	-54.9	
40-----					18	22,262	-56.7		14	22,407	-54.7		20	22,420	-51.4		21	22,422	-53.5		13	22,336	-53.6		17	22,357	-53.1	
30-----					12	24,090	-53.6		11	24,257	-51.9		19	24,294	-49.6		17	24,288	-50.5		9	24,188	-51.1		12	24,219	-50.7	
20-----					7	26,705	-50.4		5	26,884	-48.6																	

Standard pressure surface (mb)	OKLAHOMA CITY, OKLA. (969 MB.)				OMAHA, NEBR. (979 MB.)				PHOENIX, ARIZ. (970 MB.)				PITTSBURGH, PA. (976 MB.)				PORTLAND, ME. (1011 MB.)				RAPID CITY, S. DAK. (904 MB.)				ST. CLOUD, MINN. (978 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	391	28.7	52	31	300	24.2	78	31	341	34.1	36	31	375	20.0	77	31	20	16.0	85	31	966	21.9	55	31	316	18.5	80
1000---	31	104			31	116			31	66			31	137			31	111	17.7	74	31	72			31	124		
950----	31	568	29.7	44	31	570	23.6	72	31	533	33.2	34	31	584	19.7	72	31	554	17.0	62	31	531			31	575	20.0	67
900----	31	1,047	27.3	44	31	1,038	21.6	68	31	1,018	29.4	36	31	1,047	17.2	73	31	1,009	13.8	66	31	1,004	22.4	52	31	1,033	16.7	68
850----	31	1,549	23.4	48	31	1,533	19.5	61	31	1,524	25.1	40	31	1,533	14.2	72	31	1,489	10.7	66	31	1,500	21.1	50	31	1,518	13.7	64
800----	31	2,075	19.4	52	31	2,053	16.8	56	31	2,052	20.5	47	31	2,043	11.0	69	31	1,991	8.0	60	31	2,022	17.5	50	31	2,027	11.5	51
750----	31	2,626	15.2	54	31	2,605	13.3	55	31	2,607	15.7	52	31	2,587	8.4	64	31	2,529	5.5	52	31	2,577	13.5	51	31	2,570	8.5	48
700----	31	3,207	11.2	51	31	3,177	9.3	58	31	3,186	10.9	56	31	3,147	5.4	58	31	3,083	2.7	43	31	3,147	9.7	48	31	3,131	5.4	47
650----	30	3,822	7.1	45	31	3,793	5.0	58	31	3,808	6.6	53	31	3,754	2.2	53	31	3,682	- .6	43	31	3,763	5.2	45	31	3,739	2.0	40
600----	30	4,474	2.8	43	31	4,437	.7	54	31	4,452	2.0	47	31	4,393	- 1.0	46	31	4,315	- 4.1	41	31	4,406	- .1	49	31	4,375	- 1.8	40
550----	30	5,176	- 1.6	38	31	5,135	- 3.7	50	31	5,153	- 2.5	43	31	5,083	- 5.1	45	31	4,997	- 8.2	41	31	5,097	- 4.9	45	30	5,064	- 6.1	36
500----	30	5,926	- 5.7	35	31	5,878	- 8.1	41	31	5,900	- 6.7		30	5,827	- 9.4	40	31	5,730	-13.1	36	31	5,838	-10.0	43	30	5,801	-11.0	35
450----	30	6,759	-10.8	29	30	6,700	-13.2	39	31	6,728	-11.9		30	6,643	-14.7	40	30	6,533	-18.0	38	31	6,655	-15.4		30	6,611	-16.7	33
400----	30	7,638	-17.1		30	7,575	-19.4	40	31	7,606	-17.9		29	7,520	-20.6		30	7,395	-24.2	41	31	7,522	-21.8		30	7,476	-22.9	
350----	30	8,625	-24.1		30	8,554	-26.1		30	8,589	-25.4		29	8,493	-27.7		30	8,355	-31.1	41	31	8,491	-29.1		30	8,439	-30.2	
300----	30	9,730	-32.4		30	9,650	-34.3		30	9,688	-33.6		29	9,581	-35.8		30	9,430	-38.5		31	9,573	-37.4		30	9,517	-38.3	
250----	29	10,987	-42.4		27	10,904	-43.7		30	10,942	-43.0		27	10,821	-45.1		30	10,657	-46.8		31	10,806	-46.5		30	10,746	-46.7	
200----	29	12,457	-53.5		27	12,371	-53.8		30	12,411	-53.9		27	12,279	-54.6		27	12,104	-52.7		30	12,259	-54.4		30	12,199	-53.7	
175----	29	13,305	-59.1		26	13,219	-58.9		30	13,256	-59.6		27	13,124	-58.6		25	12,961	-54.3		29	13,103	-56.7		30	13,051	-56.3	
150----	29	14,257	-64.6		26	14,175	-63.1		30	14,206	-65.3		27	14,083	-62.4		25	13,944	-55.8		29	14,073	-59.5		30	14,024	-58.3	
125----	28	15,359	-68.3		24	15,285	-65.3		28	15,302	-69.1		26	15,199	-64.5		23	15,104	-57.2		26	15,209	-62.1		30	15,165	-59.8	
100----	24	16,688	-69.0		23	16,637	-65.4		27	16,633	-68.8		20	16,556	-63.4		22	16,514	-58.0		25	16,585	-62.2		29	16,554	-60.1	
80-----	21	18,034	-64.0		21	18,009	-62.1		26	17,983	-64.0		9	17,939	-62.6		22	17,926	-55.6		23	17,970	-59.5		29	17,951	-58.0	
60-----	18	19,818	-58.3		20	19,803	-57.7		25	19,769	-58.5		5	19,742	-56.9		20	19,767	-53.1		22	19,785	-55.9		29	19,773	-55.3	
50-----	17	20,973	-56.0		16	20,963	-55.6		23	20,920	-56.2		5	20,897	-55.7		18	20,948	-51.8		22	20,948	-54.5		29	20,940	-53.7	
40-----	15	22,403	-53.9		13	22,388	-52.4		23	22,343	-54.4						16	22,393	-51.0		22	22,383	-52.4		26	22,382	-51.2	
30-----	13	24,260	-51.0		10	24,245	-50.3		20	24,188	-51.9						10	24,277	-49.0		19	24,253	-49.9		20	24,260	-49.3	
20-----									12	26,830	-48.9										5	26,931	-47.8					
15-----									6	28,716	-47.4																	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

Standard pressure surface (mb.)	SAN ANTONIO, TEX. (986 MB.)				SAN JUAN, P. R. (1014 MB.)				SANTA MARIA, CALIF. (1006 MB.)				S. STE. MARIE, MICH. (990 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	243	29.9	53	31	19	26.8	83	30	71	15.1	83	31	221	14.9	87
1000---	31	119			31	143	26.0	81	30	126	14.4	83	31	133		
950----	31	582	27.6	58	31	597	22.9	82	30	571	15.3	75	31	575	16.0	68
900----	31	1,055	24.2	63	31	1,065	19.9	82	30	1,023	19.7	37	31	1,029	13.5	66
850----	31	1,554	21.1	64	31	1,557	17.0	80	30	1,514	18.5	29	31	1,507	10.3	67
800----	31	2,077	17.5	63	31	2,073	14.4	72	30	2,030	15.6	26	31	2,010	7.5	63
750----	31	2,623	14.3	58	31	2,620	12.1	58	30	2,579	12.3	29	31	2,549	4.7	62
700----	31	3,206	11.1	50	31	3,192	9.2	46	30	3,149	9.0		31	3,099	2.0	58
650----	30	3,816	7.7	44	31	3,807	5.3	46	30	3,764	5.6		31	3,699	- 1.1	48
600----	29	4,475	3.8	38	31	4,452	1.7	45	30	4,409	1.7		31	4,328	- 4.5	43
550----	29	5,179	- .5	37	31	5,153	- 2.3	39	30	5,106	- 2.9		31	5,012	- 8.5	37
500----	29	5,932	- 5.2	34	31	5,899	- 6.6	37	30	5,852	- 7.9		30	5,739	-13.3	37
450----	29	6,765	-10.5	37	31	6,727	-11.9	37	30	6,672	-13.8		30	6,543	-18.7	38
400----	28	7,648	-16.8	37	31	7,607	-17.4		30	7,547	-20.2		30	7,401	-25.0	36
350----	28	8,637	-23.6		31	8,592	-24.7		29	8,519	-27.8		30	8,358	-32.0	
300----	28	9,744	-32.2		31	9,694	-33.3		29	9,608	-36.3		30	9,429	-39.7	
250----	27	11,004	-41.9		31	10,947	-43.6		29	10,847	-45.5		30	10,653	-47.6	
200----	27	12,478	-53.4		31	12,410	-55.0		29	12,306	-53.9		26	12,105	-52.3	
175----	25	13,323	-59.7		31	13,251	-61.1		29	13,155	-57.5		22	12,954	-52.6	
150----	24	14,273	-65.4		31	14,193	-66.5		29	14,120	-61.2		21	13,950	-54.5	
125----	22	15,369	-69.6		30	15,285	-70.9		29	15,242	-64.2		18	15,111	-56.7	
100----	18	16,690	-70.9		28	16,598	-72.8		27	16,601	-65.2		10	16,529	-57.2	
80-----	17	18,026	-65.8		25	17,915	-69.9		26	17,970	-61.9		6	17,961	-55.8	
60-----	17	19,795	-60.2		24	19,657	-63.1		25	19,766	-58.1					
50-----	16	20,940	-57.3		24	20,786	-59.9		25	20,920	-55.8					
40-----	14	22,349	-54.8		22	22,188	-57.4		22	22,345	-53.9					
30-----	9	24,197	-52.0		19	24,017	-55.1		16	24,198	-51.3					
20-----																

Standard pressure surface (mb.)	SPOKANE, WASH. (930 MB.)				SWAN ISLAND, W. I. (1013 MB.)				TACUBAYA, MEXICO (775 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	722	20.5	41	31	10	27.3	83	30	2,306	16.4	71
1000---	31	90			31	121	26.8	82	30	68		
950----	31	539			31	578	23.6	80	30	532		
900----	31	1,007	18.9	42	31	1,045	20.6	77	30	1,009		
850----	31	1,495	14.9	45	31	1,537	17.7	73	30	1,504		
800----	31	2,004	10.6	50	31	2,054	14.6	65	30	2,036		
750----	31	2,543	6.2	56	31	2,602	12.0	55	30	2,585	14.6	68
700----	31	3,100	2.2	56	31	3,173	8.9	47	30	3,162	10.3	71
650----	31	3,695	- 1.6	53	31	3,791	5.3	48	30	3,779	5.6	78
600----	31	4,328	- 5.8	51	31	4,433	1.5	46	30	4,426	1.1	80
550----	31	5,003	-10.5	47	31	5,128	- 2.5	41	30	5,122	- 2.9	76
500----	31	5,730	-15.7	46	31	5,880	- 7.0	39	30	5,871	- 7.4	68
450----	31	6,523	-21.4	47	31	6,705	-11.7	35	30	6,695	-12.2	58
400----	31	7,374	-27.4	45	31	7,588	-17.3	35	29	7,578	-17.6	50
350----	31	8,320	-34.6	42	29	8,575	-24.1		25	8,561	-24.4	48
300----	31	9,378	-42.4		29	9,681	-32.4		22	9,665	-32.9	43
250----	31	10,588	-49.8		28	10,938	-42.3		19	10,922	-43.0	
200----	30	12,039	-51.0		27	12,407	-54.1		15	12,382	-55.2	
175----	29	12,907	-50.9		27	13,250	-60.6		15	13,222	-61.5	
150----	29	13,909	-51.3		25	14,192	-67.1		12	14,161	-67.8	
125----	27	15,090	-53.3		21	15,277	-71.5		9	15,242	-72.5	
100----	17	16,533	-55.6		18	16,589	-71.7		7	16,545	-73.6	
80-----	15	17,959	-54.5		17	17,909	-68.8					
60-----	10	19,820	-52.4		16	19,657	-62.7					
50-----	8	20,992	-51.2		16	20,786	-59.1					
40-----	5	22,437	-50.3		12	22,210	-55.7					
30-----					9	24,038	-55.2					
20-----												

Standard pressure surface (mb.)	TAMPA, FLA. (1016 MB.)				TATOOSH ISLAND, WASH. (1014 MB.)				VERACRUZ, MEXICO (1011 MB.)				WASHINGTON, D. C. (1006 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	7	26.0	87	31	31	12.4	95	29	13	28.6	77	31	88	21.9	75
1000---	30	151	26.4	81	31	145	12.3	93	29	114	27.8	77	31	137	22.5	71
950----	30	607	24.3	75	31	581	11.5	86	29	567	24.1	77	31	590	21.4	68
900----	30	1,077	21.4	73	31	1,027	10.3	79	29	1,040	21.5	68	31	1,051	18.7	70
850----	30	1,570	18.4	69	31	1,501	8.2	75	29	1,533	18.4	63	31	1,540	15.8	73
800----	30	2,088	15.3	67	31	2,000	5.8	70	29	2,051	15.1	62	31	2,053	12.7	71
750----	30	2,638	12.2	63	31	2,532	3.1	62	29	2,600	12.0	59	31	2,600	9.7	65
700----	30	3,208	9.0	57	31	3,083	- .1	57	29	3,170	8.8	54	31	3,164	6.7	58
650----	30	3,824	5.5	50	31	3,676	- 3.5	54	29	3,786	5.1	52	31	3,776	3.4	54
600----	30	4,468	1.7	52	31	4,301	- 7.2	48	29	4,429	1.6	47	31	4,416	.2	43
550----	30	5,171	- 2.4	48	31	4,976	-11.6	49	28	5,121	- 2.1	43	31	5,111	- 3.8	40
500----	30	5,915	- 6.7	43	31	5,697	-16.7	41	28	5,877	- 6.2	39	31	5,854	- 8.2	40
450----	30	6,742	-11.8	37	31	6,484	-22.6	39	28	6,704	-11.2	37	31	6,675	-13.4	41
400----	30	7,623	-17.6	36	31	7,333	-29.1	38	28	7,590	-16.8	34	31	7,552	-19.4	37
350----	30	8,608	-24.6	36	31	8,273	-36.0		28	8,579	-23.5		31	8,530	-26.5	37
300----	29	9,710	-32.9	38	31	9,325	-43.8		28	9,686	-32.1		31	9,624	-34.7	
250----	28	10,963	-42.8		31	10,531	-49.6		28	10,947	-42.1		31	10,872	-43.8	
200----	28	12,431	-54.0		31	11,985	-50.3		28	12,417	-54.4		30	12,333	-53.6	
175----	28	13,275	-59.7		31	12,857	-49.9		28	13,259	-60.9		29	13,178	-58.1	
150----	26	14,225	-65.3		31	13,863	-50.6		28	14,202	-67.0		29	14,138	-61.7	
125----	26	15,321	-69.9		31	15,047	-51.9		25	15,289	-71.9		29	15,260	-63.7	
100----	25	16,642	-70.1		31	16,488	-53.0		20	16,599	-73.3		28	16,624	-63.0	
80-----	21	17,982	-66.2		30	17,928	-53.2		17	17,909	-69.3		26	18,003	-60.3	
60-----	19	19,745	-61.8		28	19,782	-52.6		8	19,634	-64.2		24	19,816	-55.6	
50-----	19	20,883	-59.4		27	20,961	-52.4		8	20,758	-60.5		22	20,979	-54.7	
40-----	18	22,281	-56.7		25	22,404	-51.3		7	22,153	-57.3		20	22,410	-52.6	
30-----	16	24,123	-53.7		20	24,280	-49.8						19	24,275	-50.1	
20-----	9	26,761	-49.4										8	26,946	-46.1	

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20 Air Force Data for April 1954, reprinted from the August 1954 issue with corrected Relative Humidity Data

Standard pressure surface (mb.)	DENVER, COLO. (831 MB.)				FT. WORTH, TEX. (995 MB.)				OGDEN, UTAH (854 MB.)				RANTOUL, ILL. (990 MB.)				ROME, N. Y. (1001 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	1,661	12.5	34	30	178	21.2	65	30	1,450	11.4	37	30	227	11.6	75	29	146	6.7	71
1000---	30	72			30	130	15.3		30	106			30	145			29	162	6.7	64
950----	30	522			30	579	19.8	62	30	550			30	580	11.8	68	29	584	6.0	67
900----	30	986			30	1,039	17.4	65	30	1,009			30	1,026	10.1	66	29	1,025	3.6	68
850----	30	1,470			30	1,525	14.8	64	30	1,489	12.0	33	30	1,500	8.6	61	29	1,487	1.7	68
800----	30	1,982	12.2	32	30	2,035	11.8	62	30	1,995	9.3	34	30	2,000	6.1	57	29	1,973	- .5	63
750----	30	2,519	8.5	33	30	2,580	9.4	46	30	2,527	5.0	38	29	2,532	3.5	52	29	2,491	- 2.8	57
700----	30	3,084	3.9	38	30	3,142	6.1	39	30	3,083	.4	43	29	3,081	.1	52	29	3,031	- 5.7	55
650----	30	3,681	- .9	41	30	3,748	2.1	34	30	3,671	- 4.5	50	29	3,674	- 3.8	49	28	3,607	- 9.2	52
600----	30	4,314	- 6.2	44	30	4,386	- 2.3	33	30	4,297	- 9.3	50	29	4,298	- 7.9	44	28	4,219	-12.8	50
550----	30	4,989	-11.8	48	30	5,069	- 7.3		30	4,963	-14.0	48	29	4,971	-12.4	39	28	4,877	-16.9	48
500----	30	5,710	-17.3	45	30	5,806	-12.5		30	5,680	-19.1	50	29	5,690	-17.3	39	28	5,586	-21.4	45
450----	30	6,494	-23.0	37	30	6,611	-18.2		30	6,457	-24.7	50	28	6,488	-22.6		28	6,355	-26.8	
400----	30	7,342	-29.5		30	7,471	-24.8		30	7,300	-30.9	52	28	7,331	-28.7		28	7,192	-33.2	
350----	30	8,280	-37.0		30	8,427	-32.0		30	8,233	-38.1		27	8,270	-35.8		28	8,116	-40.0	
300----	30	9,327	-45.1		30	9,497	-40.5		30	9,275	-46.3		26	9,322	-44.0		28	9,150	-47.4	
250----	30	10,519	-54.3		29	10,709	-50.3		30	10,459	-55.6		26	10,520	-53.2		28	10,333	-55.0	
200----	30	11,921	-62.0		27	12,132	-60.6		29	11,858	-61.1		23	11,923	-61.2		27	11,737	-60.9	
175----	27	12,745	-61.7		26	12,956	-63.2		27	12,686	-61.1		21	12,748	-63.7		26	12,555	-61.8	
150----	24	13,697	-61.0		22	13,894	-63.0		23	13,644	-60.3		17	13,689	-61.1		21	13,491	-59.1	
125----	17	14,824	-61.2		13	15,011	-64.9		21	14,779	-61.0		11	14,813	-60.7		17	14,641	-58.5	
100----	9	16,206	-61.6						12	16,158	-62.4		7	16,176	-62.4		14	16,050	-59.6	
80-----									5	17,519	-61.7						5	17,474	-59.3	

Note: All observations scheduled at 0300, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

SOLAR RADIATION DATA

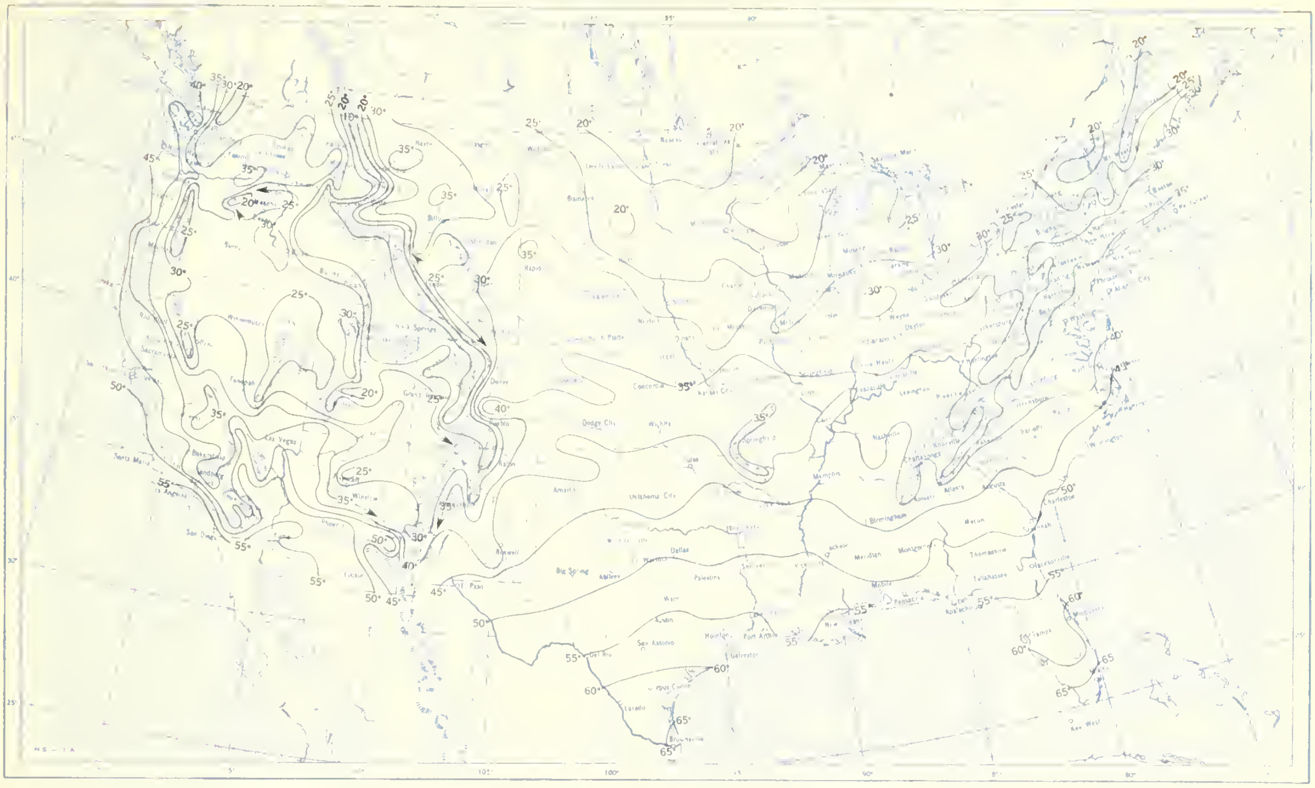
Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.

	Tallahassee, Fla.			Edmonton, Alberta	Prosser 4NE, Wash.			Edmonton, Alberta	Prosser 4NE, Wash.			Edmonton, Alberta	Ottawa, Ontario	Swan Island, W. I.			Albrook Air Base Panama, C. Z.			Albrook Air Base Panama, C. Z.	Swan Island, W. I.			Davis, Calif.			Albrook Air Base Panama, C. Z.	Davis, Calif.
1954																												
March 5---	380	May	7	449	677	June	4	106	817	July	2	188	(418)	669	Aug.	6	381	Sept.	3	377	674	Oct.	1	429	Nov.	5	455	274
6---	132		8	178	475		5	102	640		3	311	774	536		7	301		4	629	---		2	431		6	445	230
7---	532		9	157	217		6	58	324		4	630	784	103		8	420		5	499	434		3	421		7	362	223
8---	427		10	258	684		7	155	751		5	604	(329)	593		9	224		6	433	---		4	419		8	431	11
9---	504		11	78	674		8	129	573		6	691	539	685		10	330		7	502	637		5	423		9	293	60
10---	493		12	112	768		9	425	689		7	585	605	669		11	406		8	554	619		6	378		10	431	72
11---	428		13	250	766		10	504	613		8	594	(573)	695		12	267		9	511	627		7	328		11	193	59
Averages-----	414			212	609			211	630			515	(586)	564			333			501	598			404			373	133
Departures---	---			---	---			---	---			---	---	---			---			---	---			-8			---	-117
March 12---	385	May	14	540	730	June	11	347	706	July	9	316	(735)	---	Aug	13	377	Sept.	10	384	635	Oct.	8	403	Nov.	12	469	240
13---	238		15	592	498		12	708	293		10	468	(773)	---		14	404		11	367	562		9	404		13	254	218
14---	503		16	161	721		13	367	647		11	734	(745)	625		15	401		12	265	329		10	407		14	412	31
15---	560		17	610	768		14	754	600		12	501	(336)	---		16	405		13	472	524		11	395		15	326	79
16---	563		18	563	740		15	564	553		13	698	740	670		17	422		14	356	293		12	389		16	392	251
17---	521		19	650	740		16	137	772		14	634	272	644		18	245		15	370	---		13	388		17	425	265
18---	346		20	600	642		17	400	779		15	335	---	651		19	158		16	477	223		14	385		18	501	265
Averages-----	445			531	691			468	621			527	(600)	647			345			384	428			396			397	193
Departures---	---			---				---	---			---	---	---			---			---	---			16			---	-8
March 19---	61	May	21	104	730	June	18	250	784	July	16	713	---	626	Aug.	20	142	Sept.	17	182	649	Oct.	15	364	Nov.	19	424	109
20---	470		22	191	796		19	441	423		17	589	657	---		21	618		18	625	572		16	302		20	191	109
21---	514		23	533	726		20	514	806		18	729	503	628		22	358		19	576	---		17	365		21	410	41
22---	508		24	677	593		21	717	835		19	565	(611)	614		23	320		20	299	613		18	357		22	382	57
23---	478		25	205	713		22	711	831		20	357	468	430		24	425		21	456	532		19	276		23	361	45
24---	491		26	47	709		23	601	567		21	282	(640)	658		25	433		22	523	241		20	369		24	455	24
25---	546		27	291	832		24	621	802		22	638	717	648		26	519		23	621	297		21	353		25	372	36
Averages-----	438			293	728			551	721			553	(599)	601			402			469	484			341			371	60
Departures---	---			---	---			---	---			---	---	---			---			---	---			-12			---	-144
March 26---	300	May	28	515	571	June	25	638	702	July	23	589	648	601	Aug.	27	358	Sept.	24	375	---	Oct.	22	343	Nov.	26	411	230
27---	493		29	591	214		26	362	464		24	635	(440)	667		28	333		25	135	342		23	358		27	431	226
28---	270		30	789	630		27	---	753		25	681	472	685		29	385		26	470	345		24	367		28	430	236
29---	165		31	152	548		28	---	823		26	459	(586)	533		30	278		27	456	356		25	353		29	295	249
30---	366	June	1	378	839		29	---	799		27	(447)	703	667		31	380		28	426	532		26	352		30	284	182
31---	515		2	442	752		30	---	294		28	314	562	682	Sept.	1	378		29	366	---		27	348	Dec.	1	362	21
April 1---	412		3	596	388	July	1	---	578		29	586	568	---		2	---		30	203	---		28	331		2	349	28
Averages-----	360			495	563			702	630			(530)	(568)	639			352			347	394			350			366	167
Departures---	---			---	---			---	---			---	---	---			---			---	---			30			---	-1
										July	30	512	506	643								Oct.	29	297				
											31	635	(145)	682									30	303				
										Aug.	1	265	(470)	601									31	291				
											2	261	663	677								Nov.	1	277				
											3	131	202	707									2	244				
											4	108	(519)	690									3	214				
											5	265	410	681									4	259				
											Avg.	311	(416)	669									Avg.	269				
											Dep.	---	---	---									Dep.	-22				

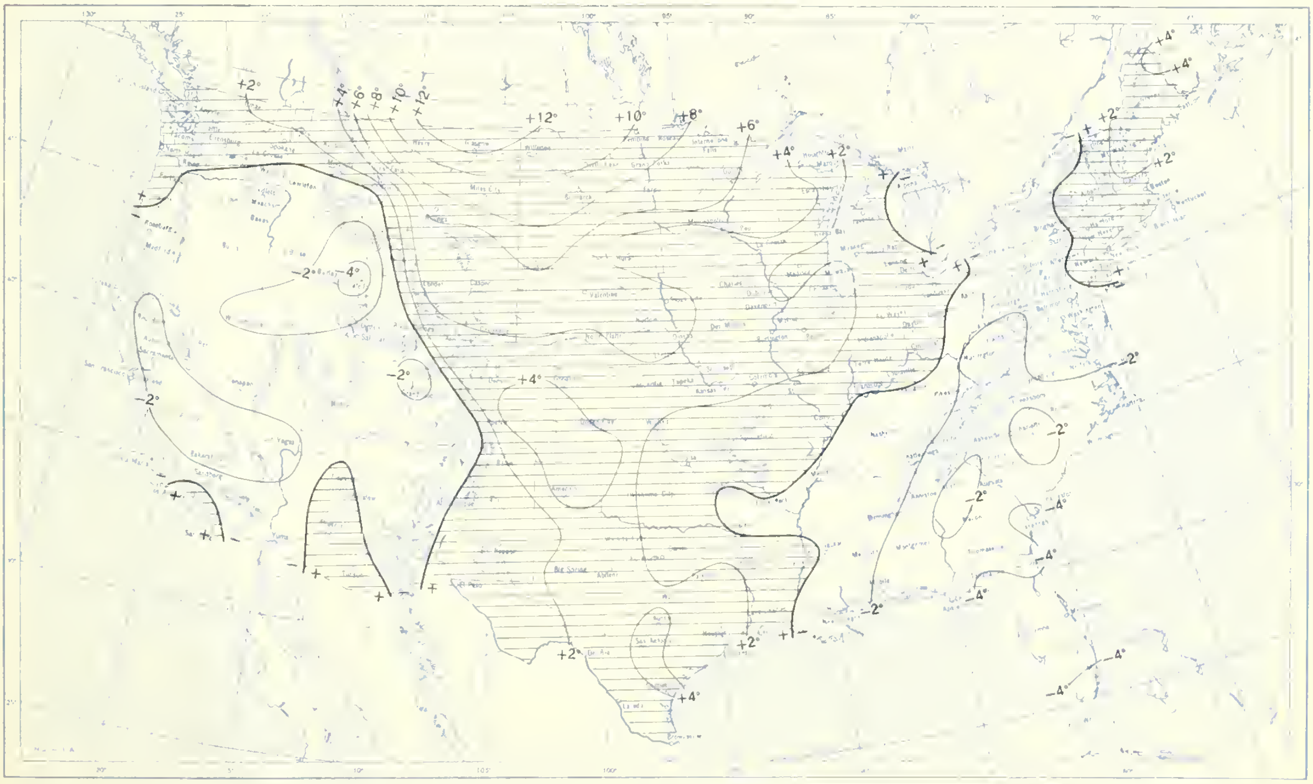
Note:--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

NWRC, Asheville, N.C. --- 3/4/55 --- 1800

Chart I. A. Average Temperature (°F.) at Surface, December 1954.

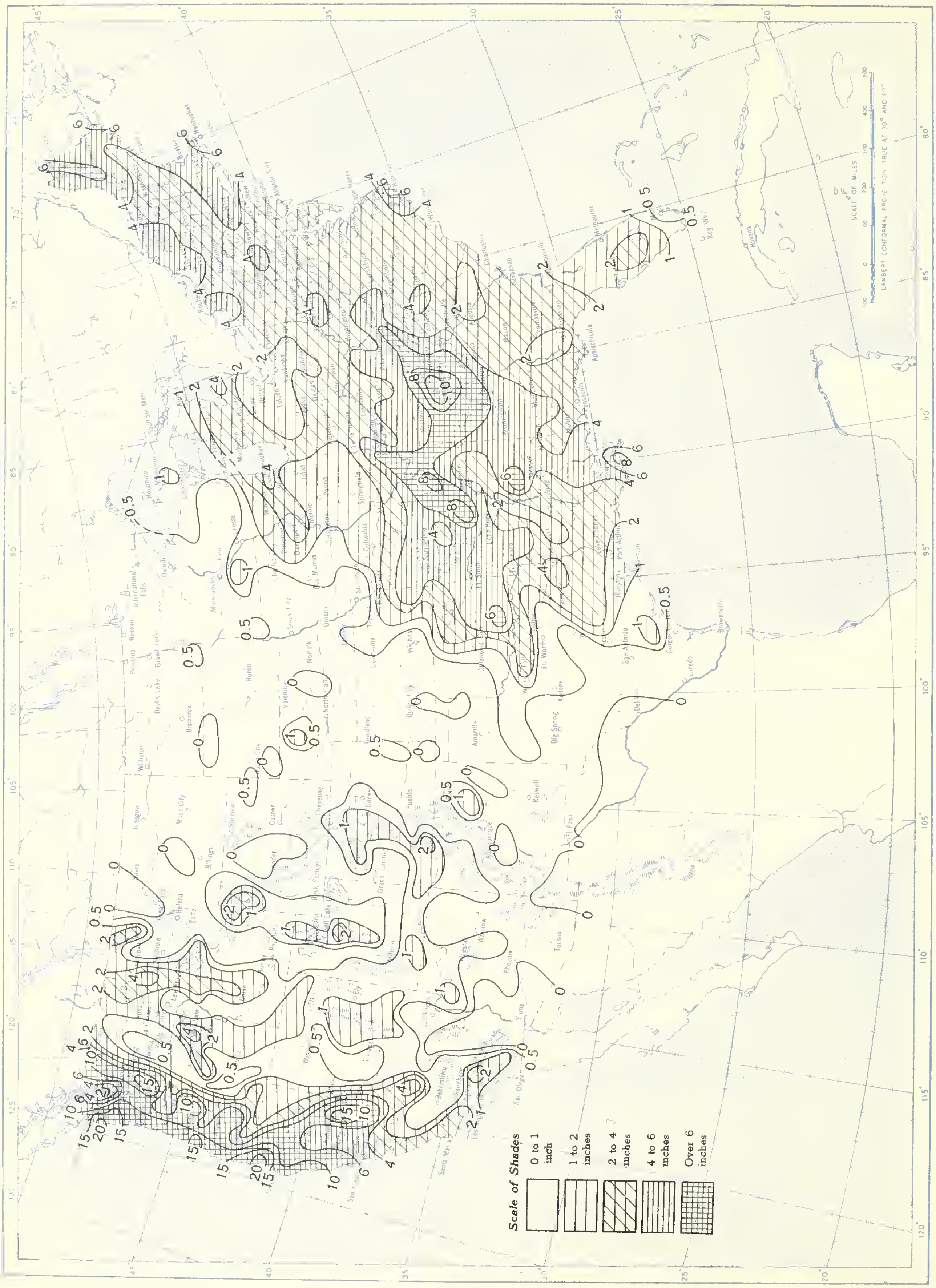


B. Departure of Average Temperature from Normal (°F.), December 1954.



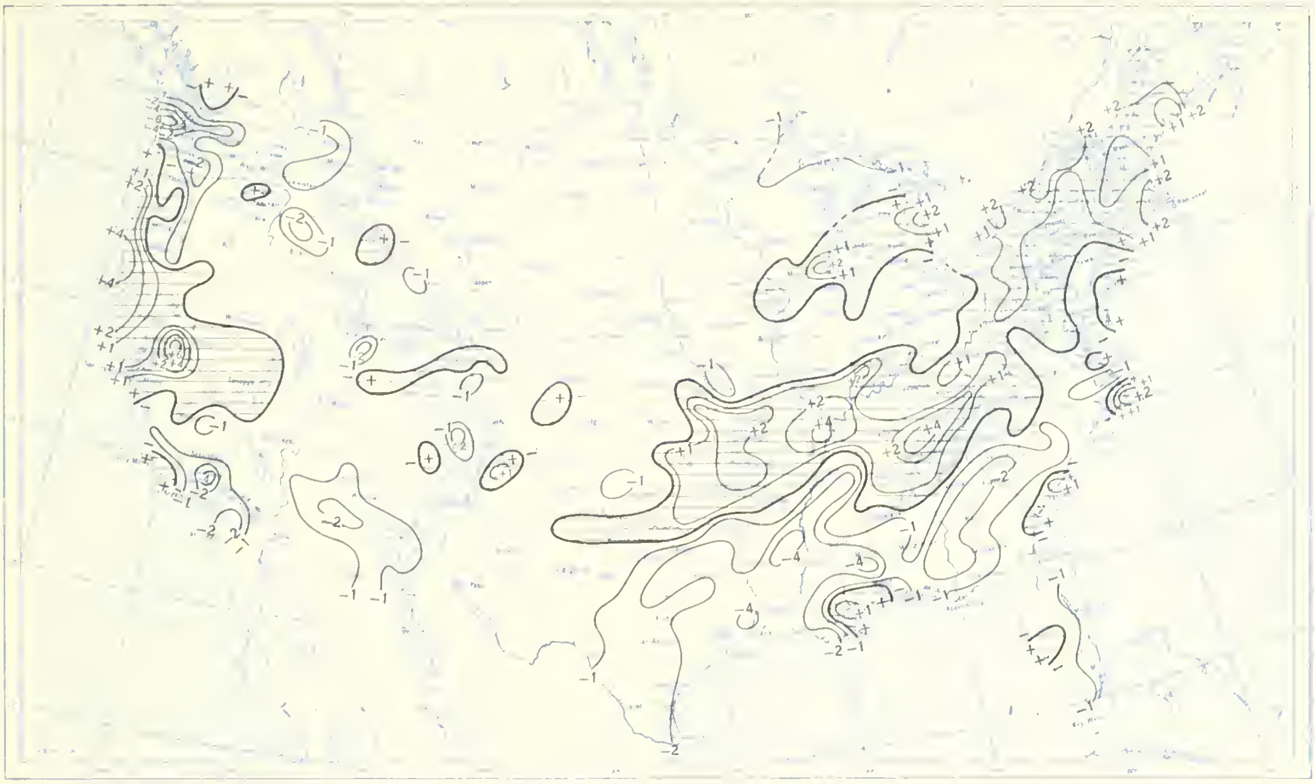
A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.
B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), December 1954.

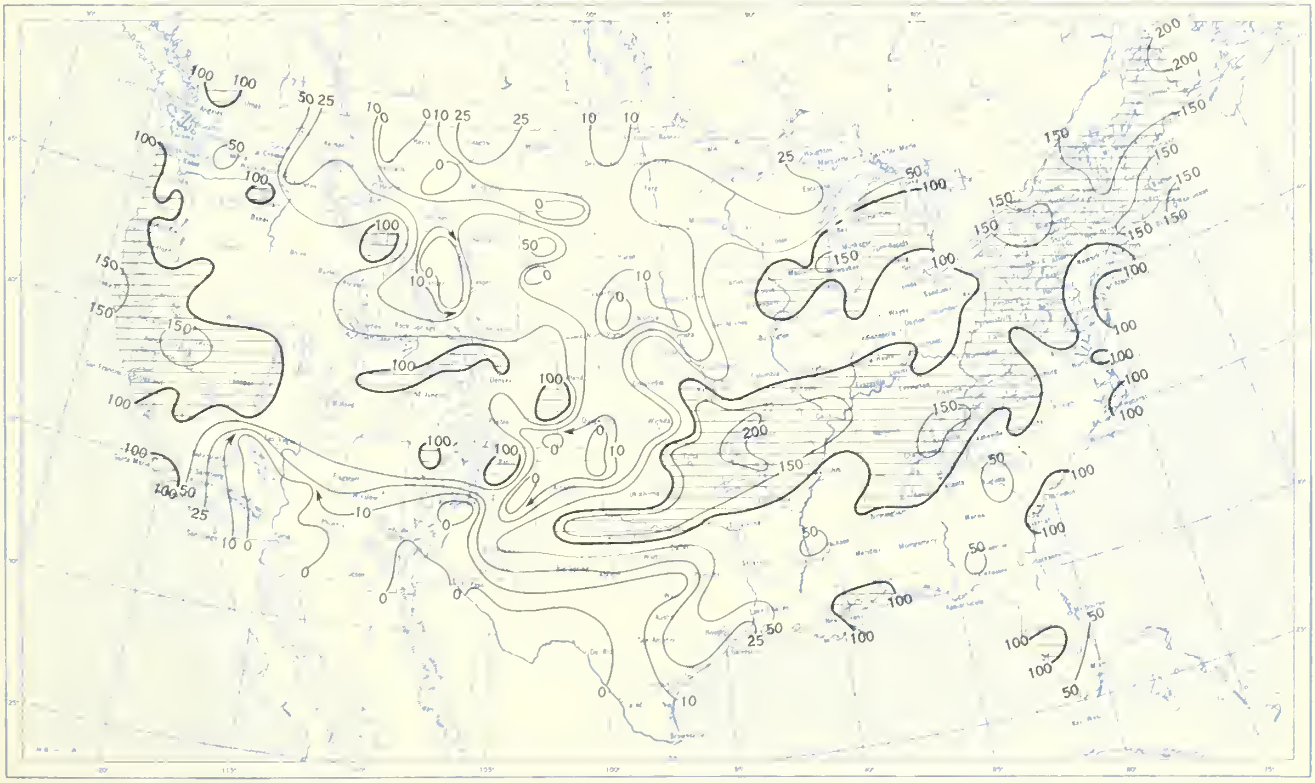


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), December 1954.

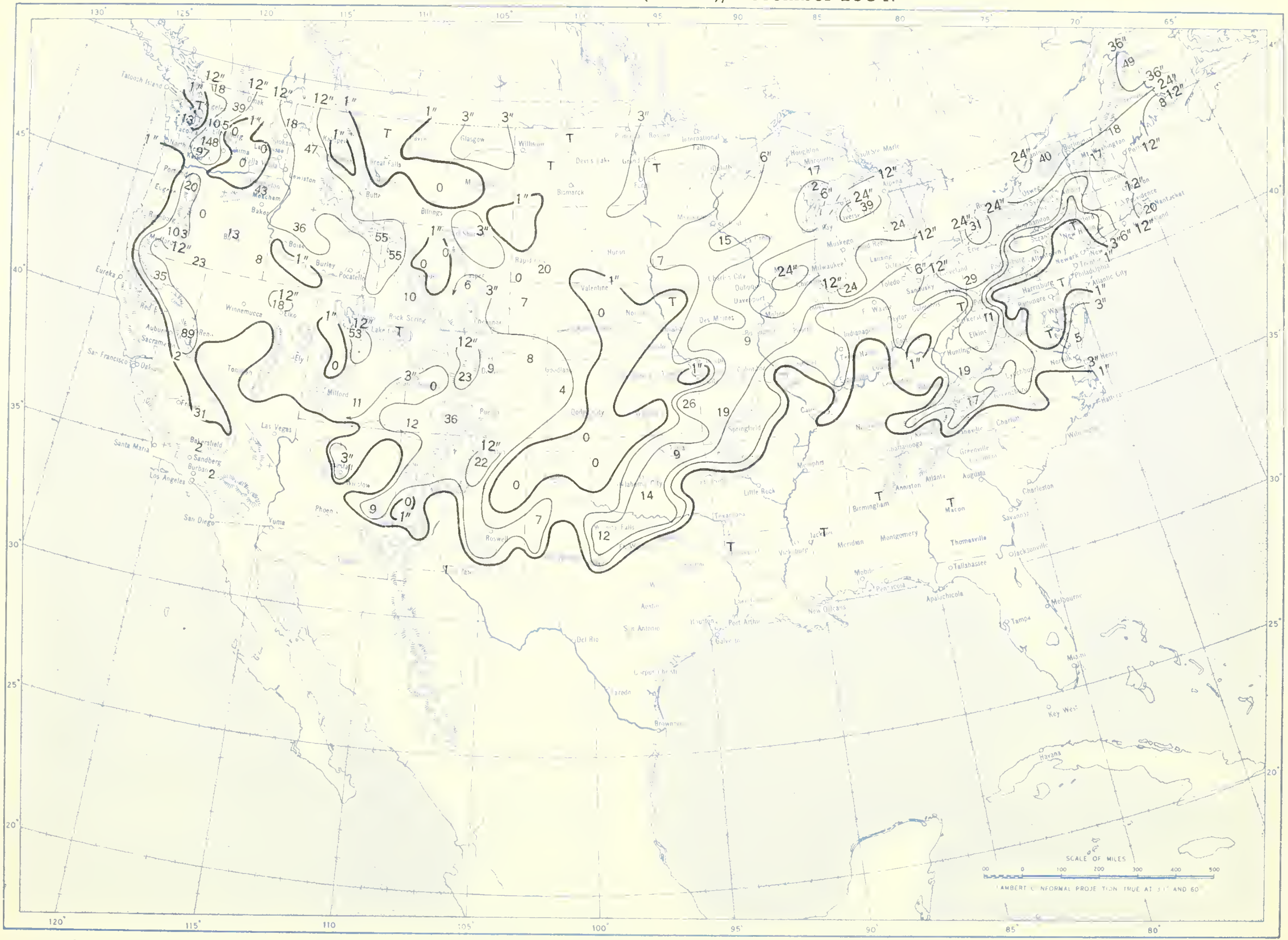


B. Percentage of Normal Precipitation, December 1954.



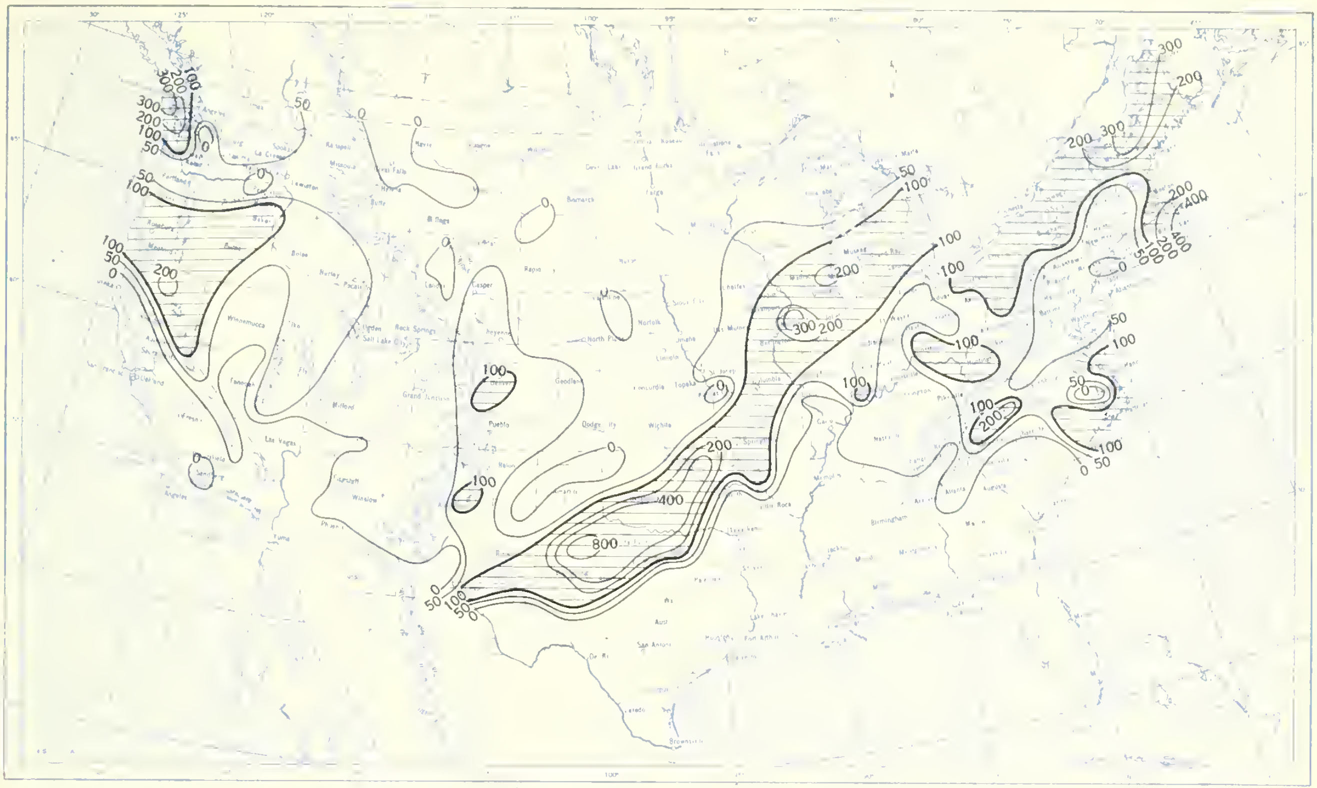
Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart IV. Total Snowfall (Inches), December 1954.

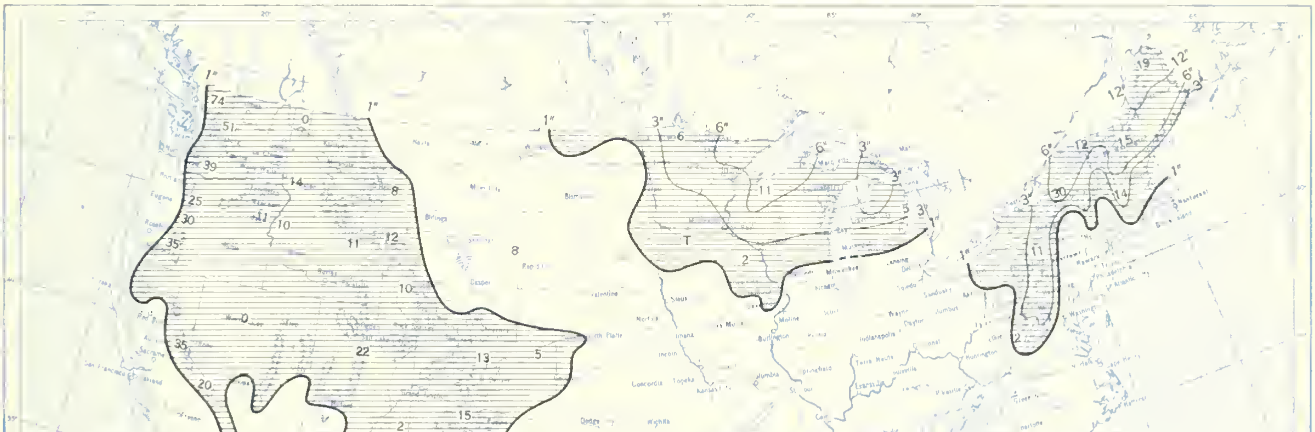


This is the total of unmelted snowfall recorded during the month at Weather Bureau and cooperative stations. This chart and Chart V are published only for the months of November through April although of course there is some snow at higher elevations, particularly in the far West, earlier and later in the year.

Chart V. A. Percentage of Normal Snowfall, December 1954.

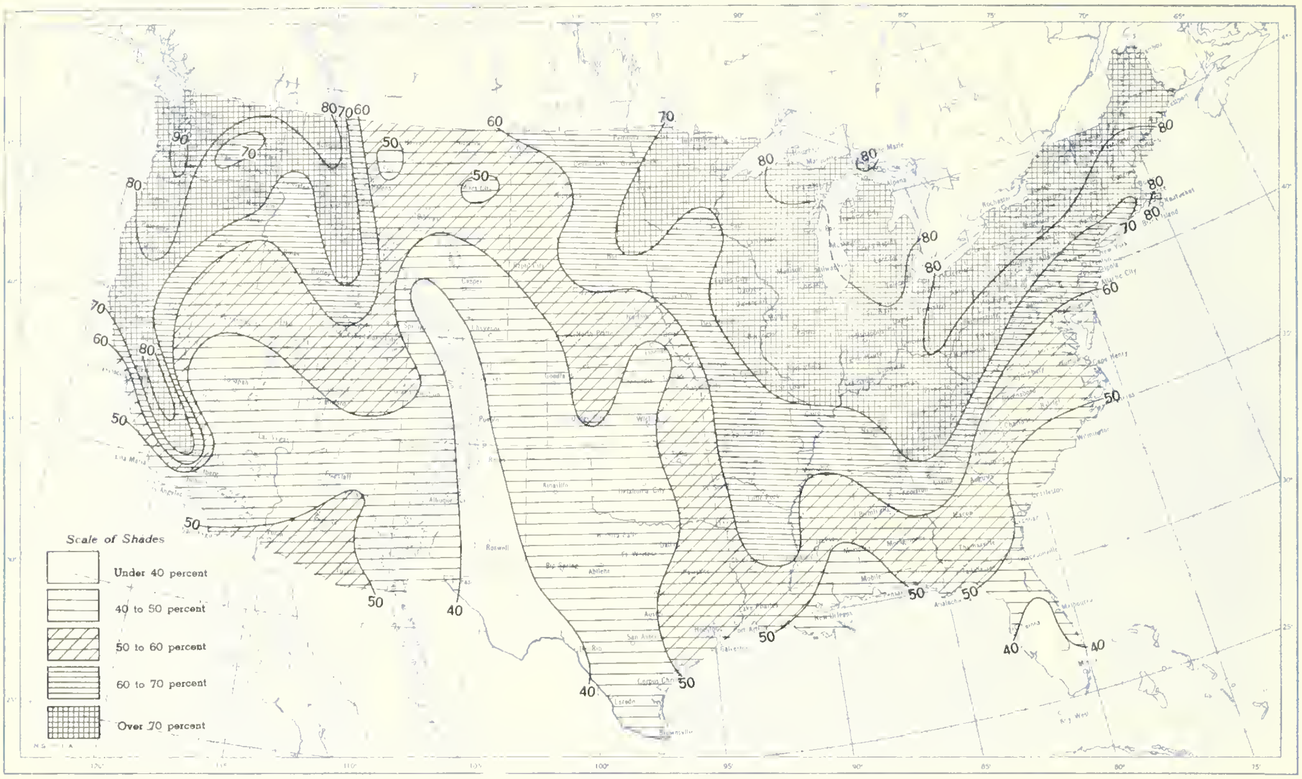


B. Depth of Snow on Ground (Inches). 7:30 a. m. E. S. T., December 28, 1954.

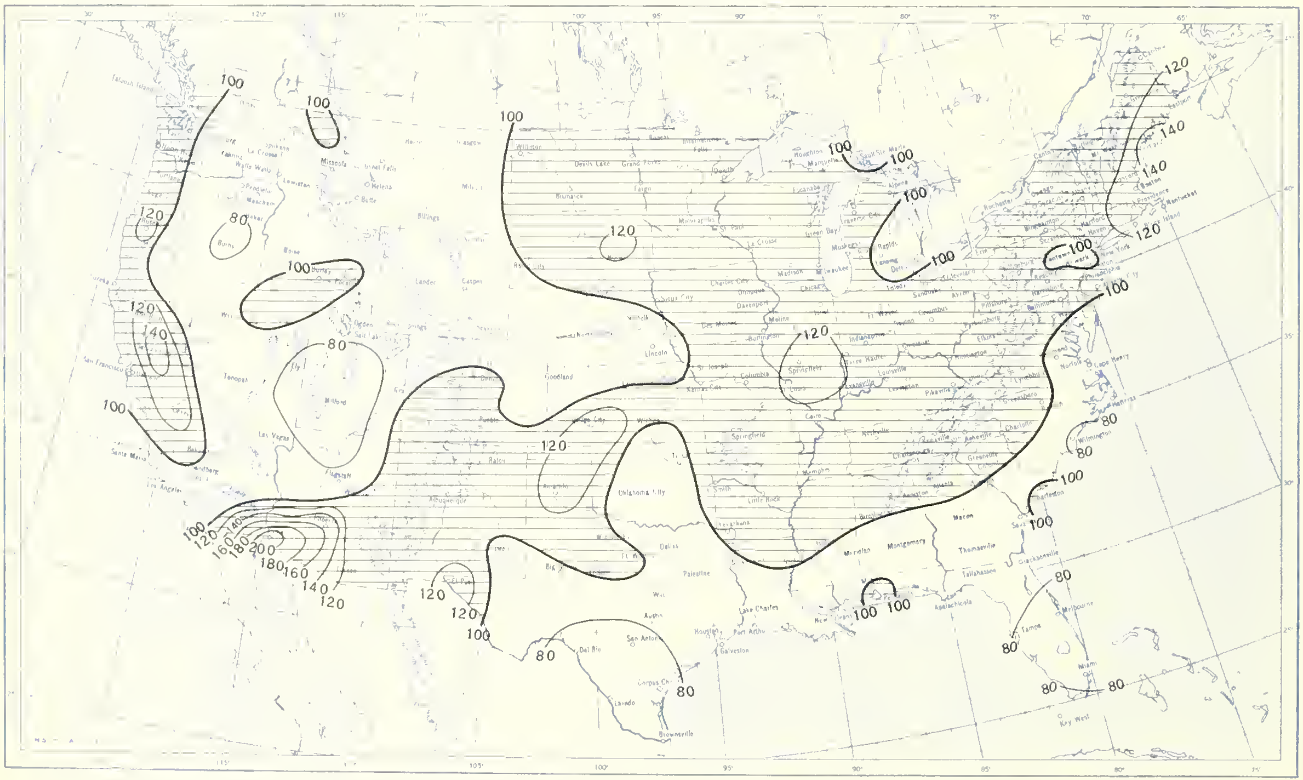


A. Amount of normal monthly snowfall is computed for Weather Bureau stations having at least 10 years of record. B. Shows depth currently on ground at 7:30 a. m. E.S.T., of the Tuesday nearest the end of the month. It is based on reports from Weather Bureau and cooperative stations. Dashed line shows greatest southern extent of snowcover during month.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, December 1954.

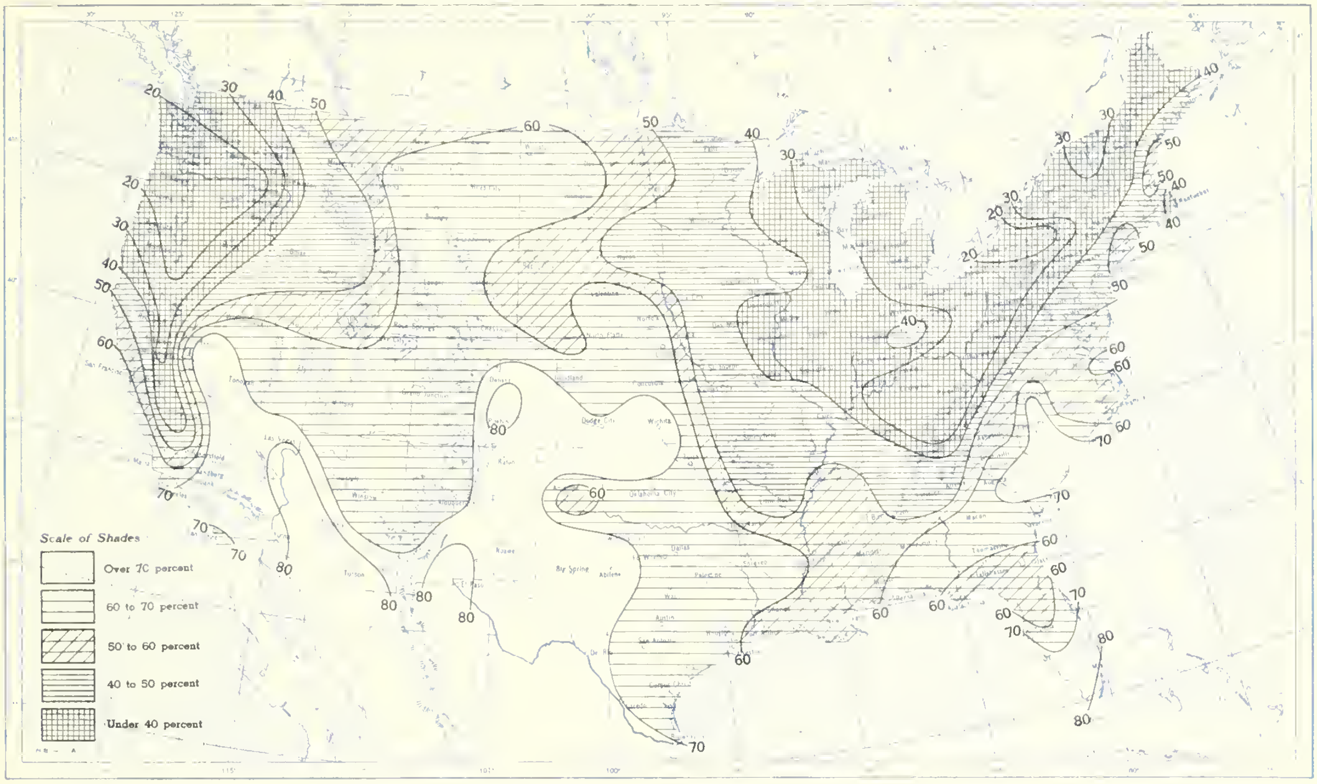


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, December 1954.

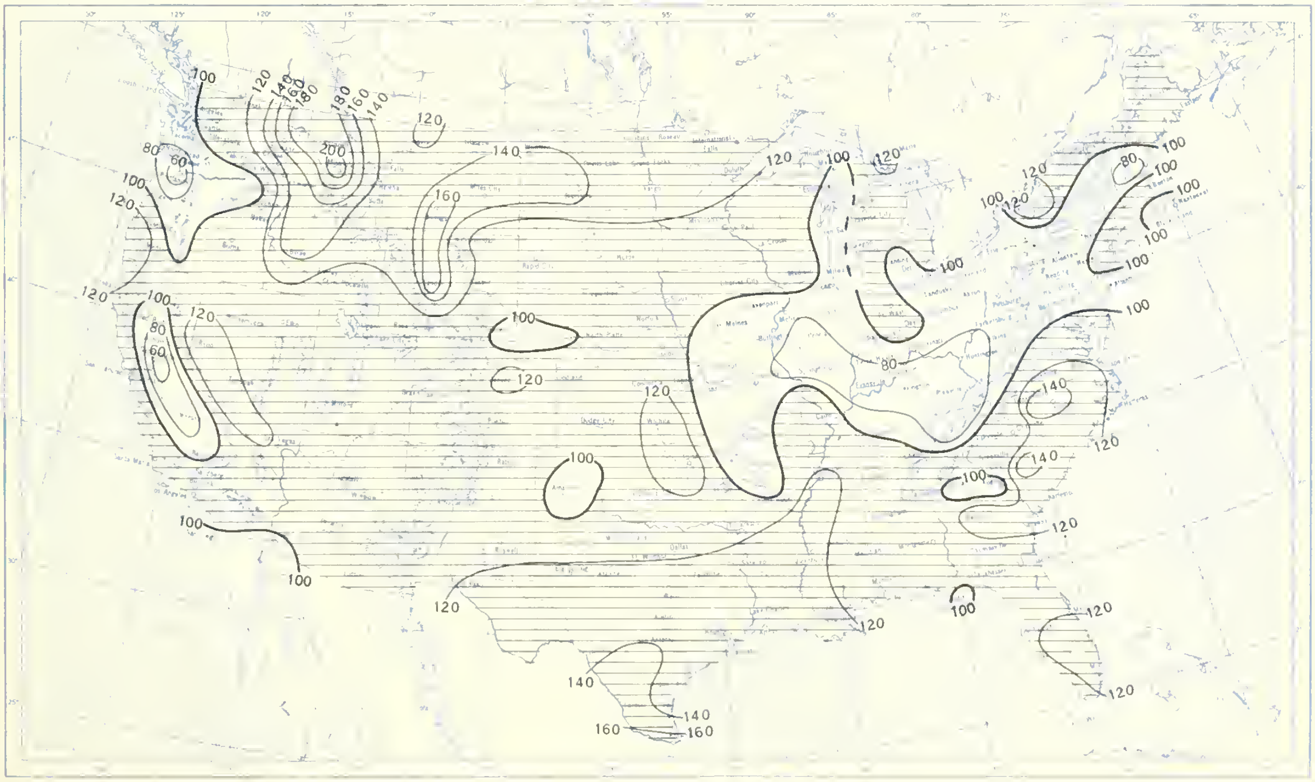


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, December 1954.



B. Percentage of Normal Sunshine, December 1954.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, December 1954. Inset: Percentage of Normal

Average Daily Solar Radiation, December 1954.

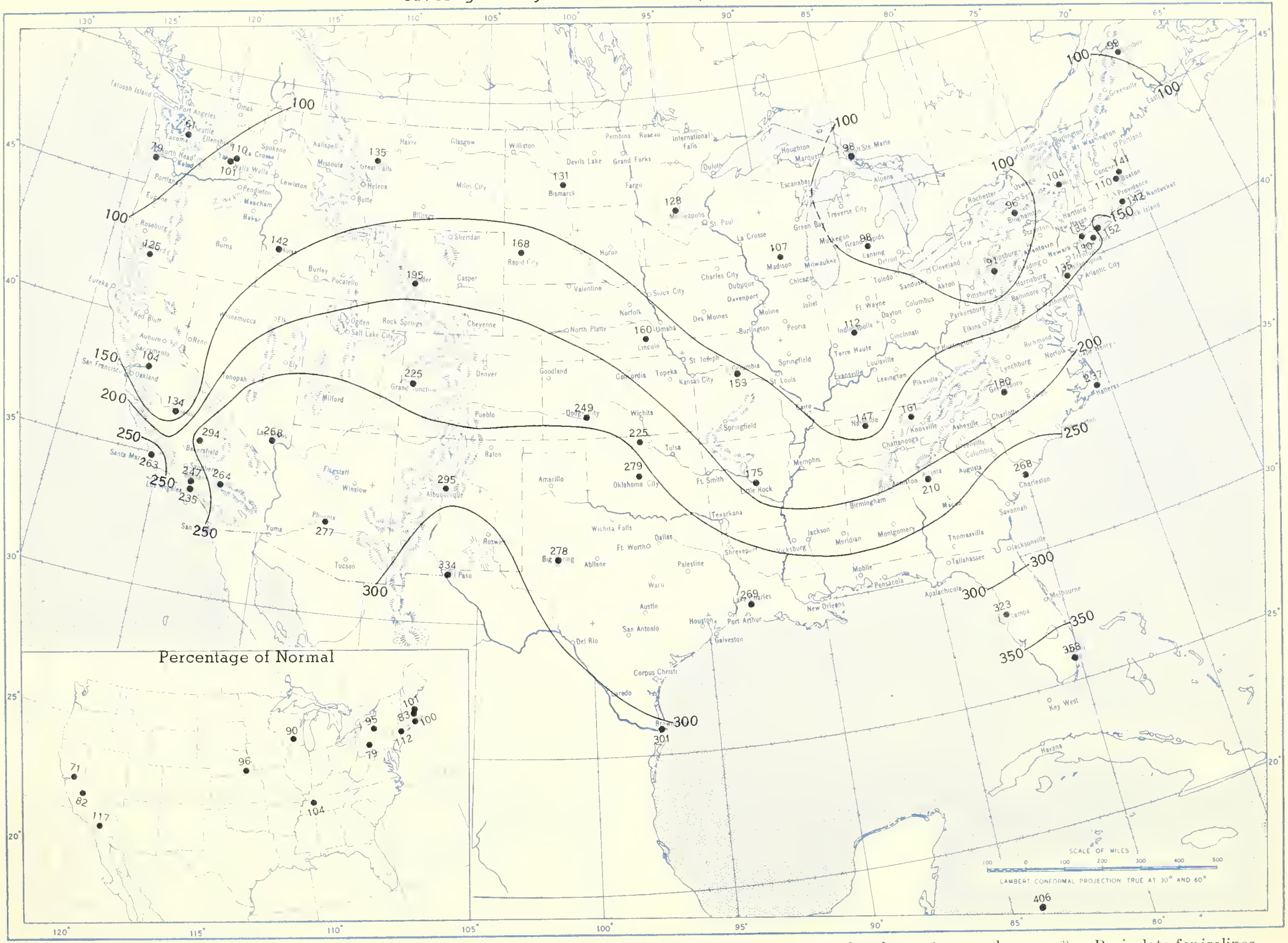
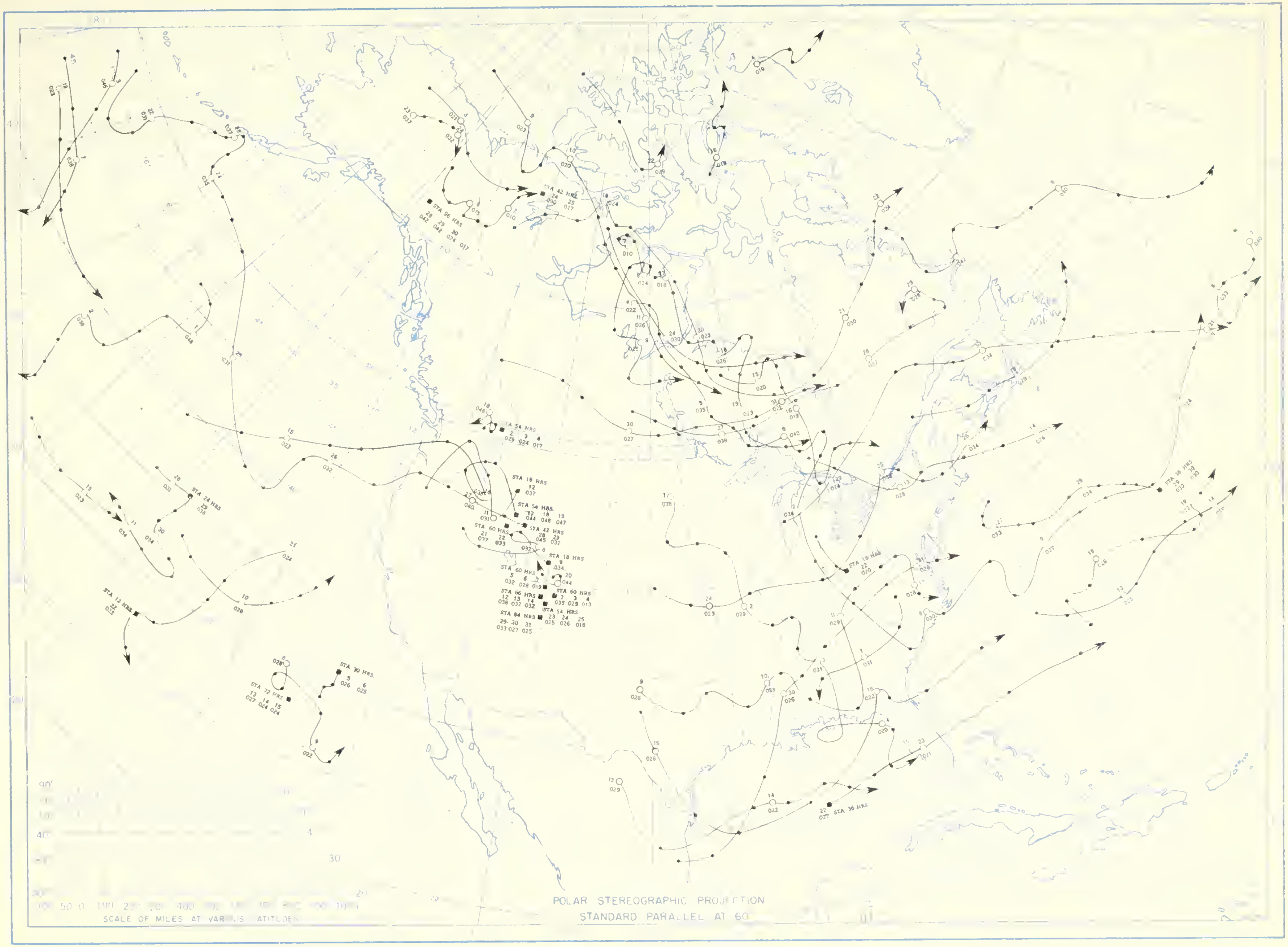


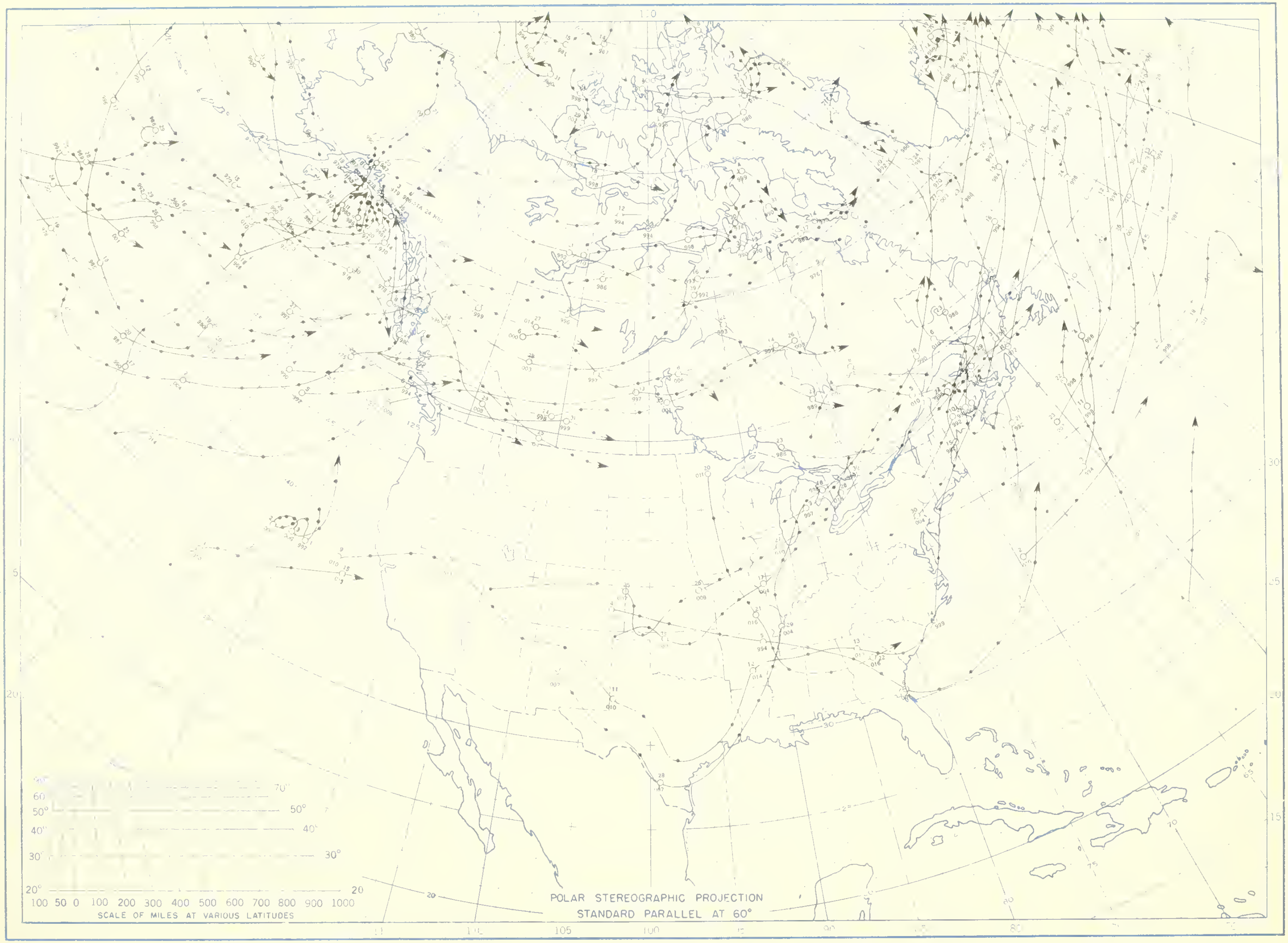
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm.$^{-2}$). Basic data for isolines are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are computed for stations having at least 9 years of record.

Chart IX. Tracks of Centers of Anticyclones at Sea Level, December 1954.



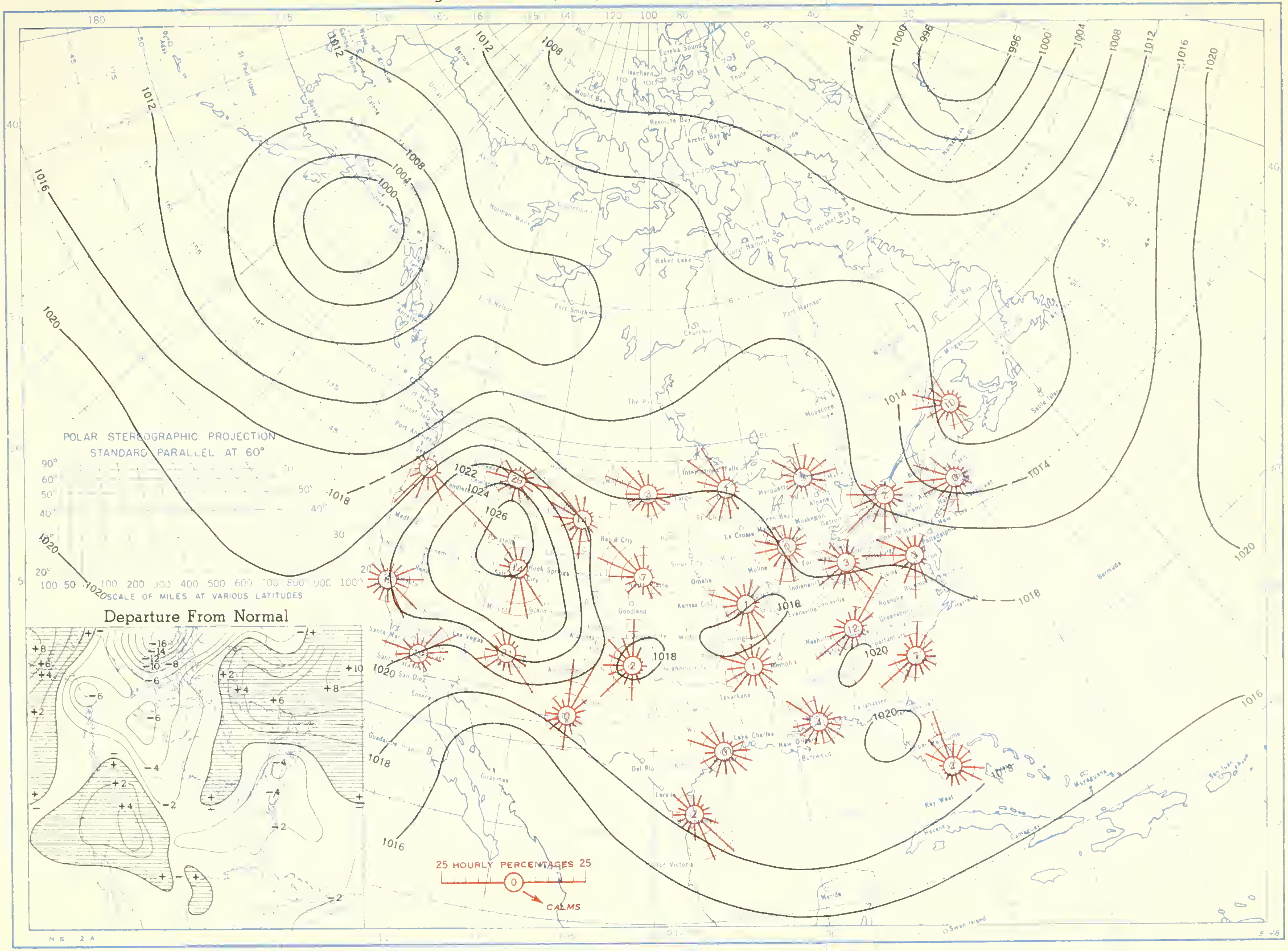
Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

Chart X. Tracks of Centers of Cyclones at Sea Level, December 1954.



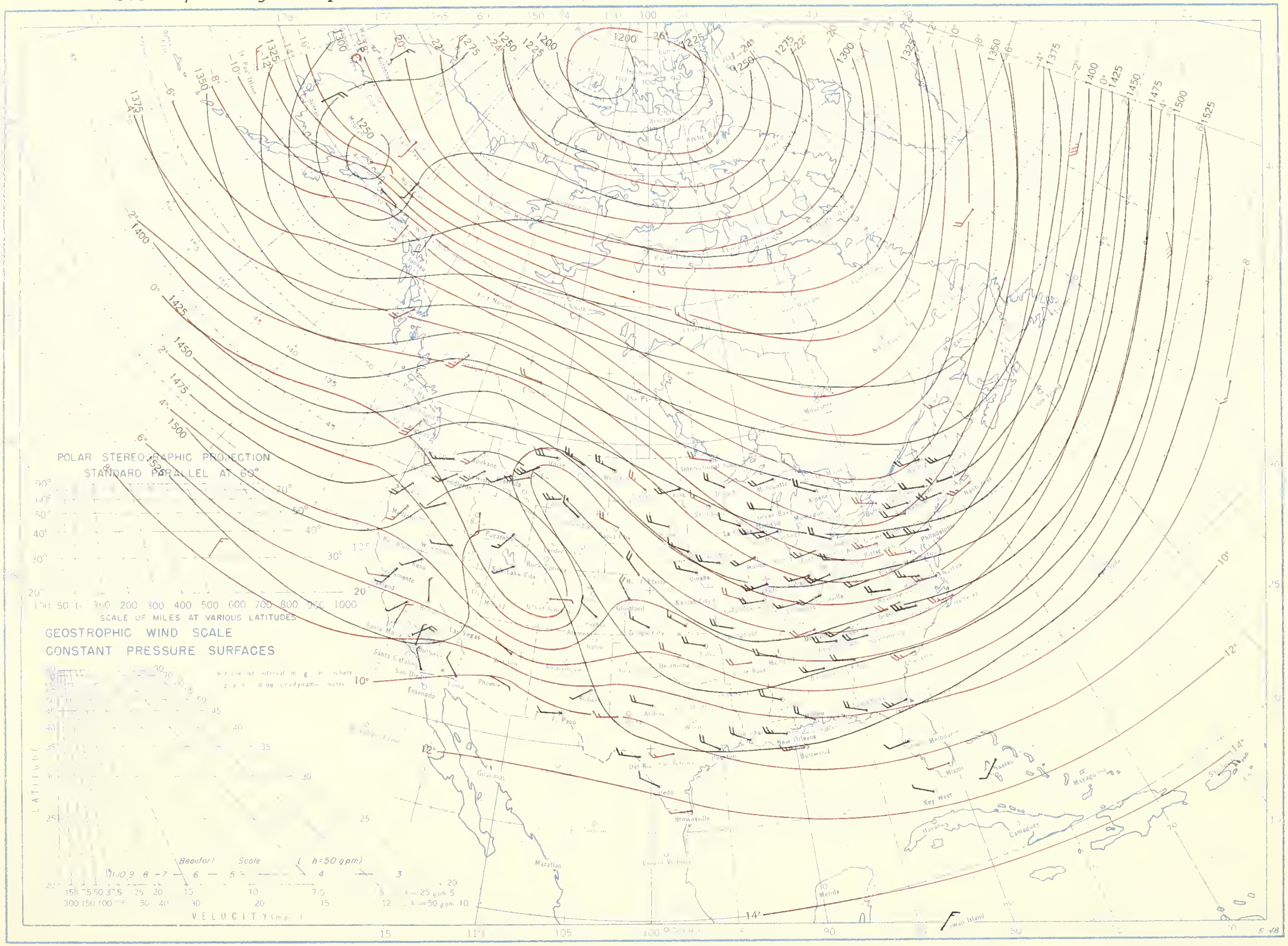
Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, December 1954. Inset: Departure of Average Pressure (mb.) from Normal, December 1954.



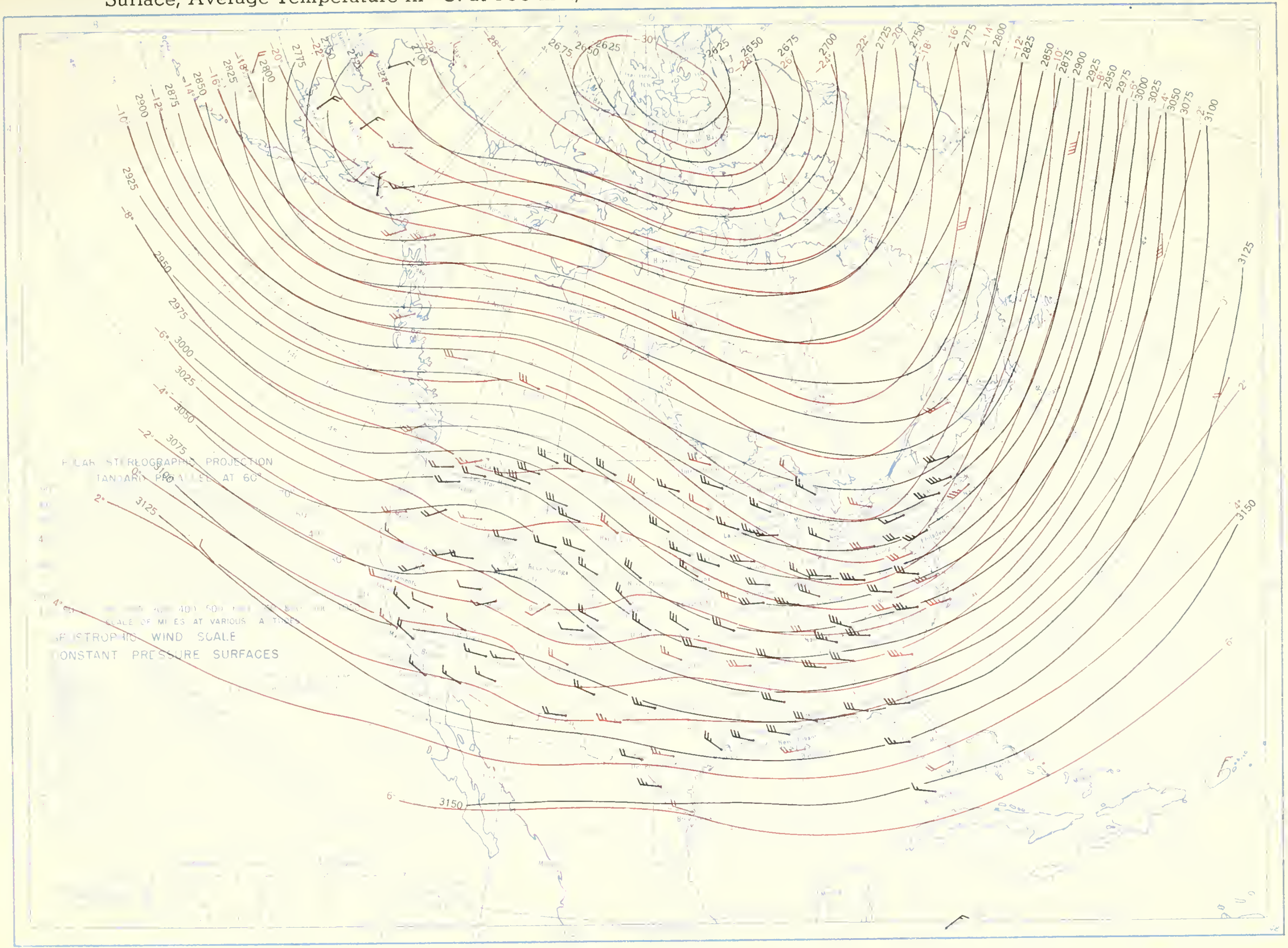
Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), December 1954.



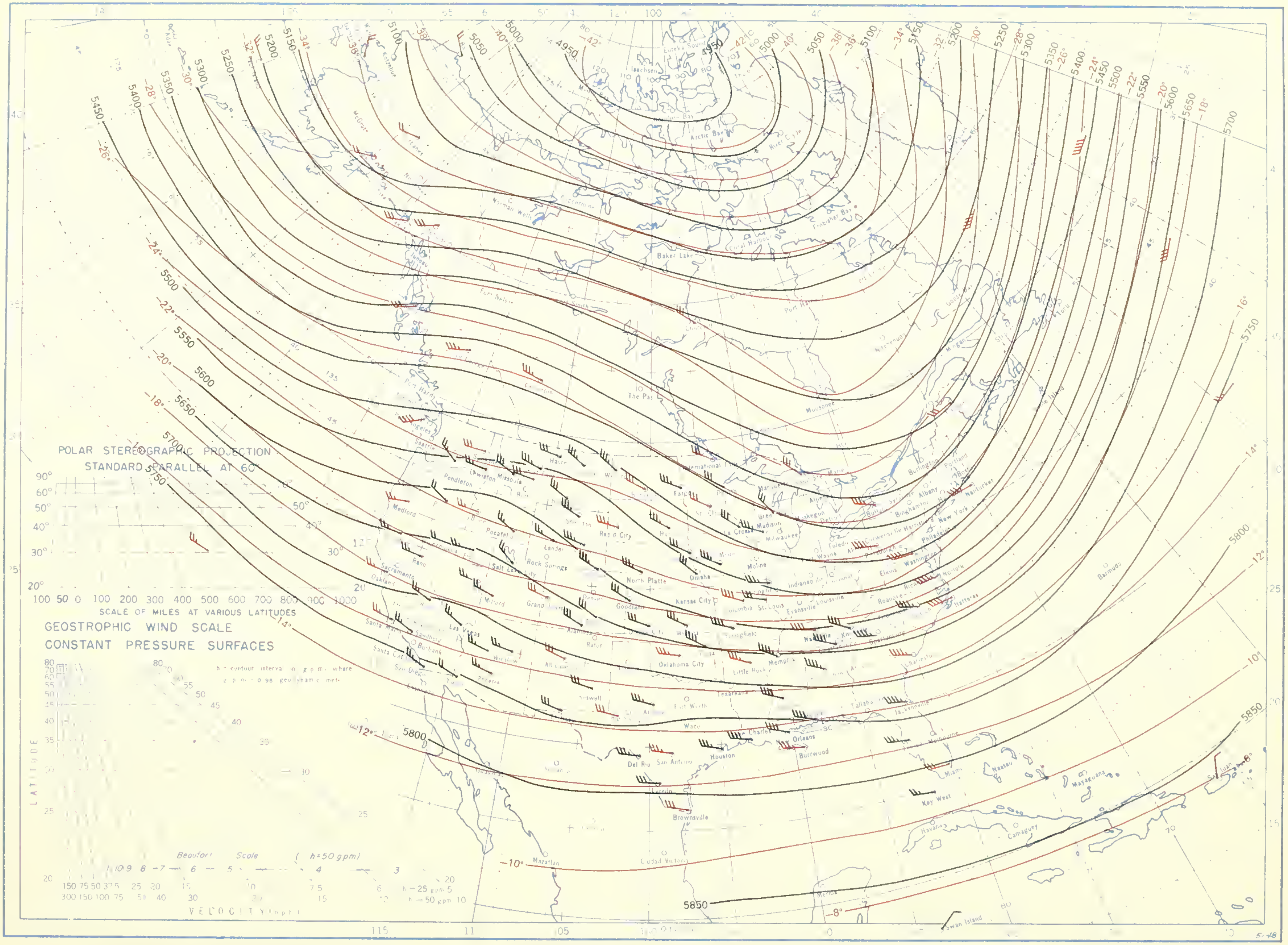
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m.. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), December 1954.



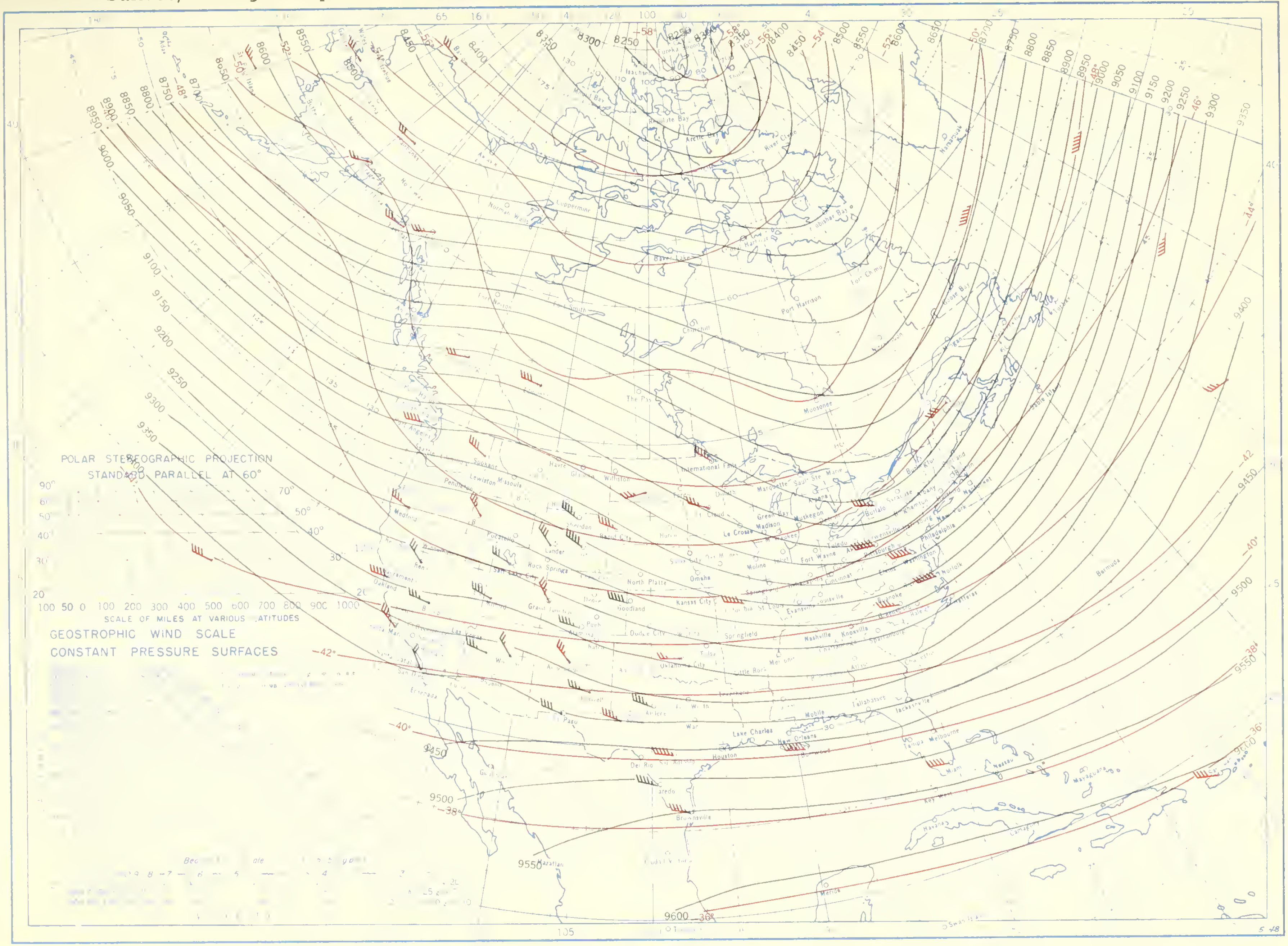
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), December 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 300-mb. Pressure Surface, Average Temperature in C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), December 1954.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

ANNUAL 1954
Volume 5 No. 13

ASHEVILLE: 1955

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

Volume 5 No. 13

ANNUAL 1954

GENERAL SUMMARY OF WEATHER CONDITIONS

The year 1954, among the driest and warmest on record, was notable for drought and destructive storms. Drought and record-breaking heat, prevailing over the southern half of the Country during the critical growing season, seriously damaged crops and reduced streamflow to a minimum of record. Hurricanes, moving up the Atlantic Coast in August, September, and October, were responsible for the major portion of the year's storm damage which totaled nearly $900,000,000.

Temperature and precipitation, however, furnished little basis for complaint in most sections of the Pacific States and the northern half of the Nation, although a number of localities in the latter area were seriously affected by destructive storms. Timely rains provided ample moisture for above average crop production and periods of uncomfortable heat were usually short. In the North Central Interior mild weather in January and February favored livestock and reduced fuel costs. The Pacific States enjoyed one of the coolest summers on record.

Some other unusual weather features occurring during the year were: New national low temperature record of -69.7° at Rogers Pass, Mont., on January 20, the mildest February on record in the North Central Interior, the hottest summer on record in parts of the South, duststorms reminiscent of the 1930's in the western portions of the lower Great Plains in February and March, the highest flood in the Rio Grande River in history in June (caused by heavy rains which fell during the passage of hurricane Alice), the heaviest snowfall since February 1899 in parts of the east Gulf region during March, a record number of tornadoes for a single year, damaging floods in New England during May and in Iowa during June, a record-breaking heat wave in the central Mississippi Valley during June and again in July, and unprecedented rains in California during August.

DROUGHT.--In the western portions of the lower Great Plains drought persisted through the third straight year. In February and March duststorms contributed to the damage of small grains and pastures. In the latter month losses from wind and dust in Colorado alone amounted to $5,000,000. April rains brought relief to Texas and Oklahoma and were helpful in some other sections. Spotted rains during May and the summer months were of very limited benefit after mid-June owing to the intense heat and dry soil. The autumn was very dry, but many sections received helpful rains in December.

The drought in the Southeast, centered in northern Florida and southern portions of Georgia and Alabama, developed during the first 3 months with less than 25 percent of normal rainfall in January and less than 50 percent in February and March. Continued below-normal rainfall combined with intense heat from mid-June to mid-October damaged crops severely. A few early crops were a complete loss, and total crop production in South Carolina was the least in 50 years.

Drought spread over the entire South in June and continued through the summer and fall. Crops suffered, soil moisture was depleted, and streamflow dwindled to or near the minimum of record. Some municipal water supplies became so low that rationing was necessary. December rains replenished surface moisture in many sections, but subsoil moisture generally remained depleted.

PRECIPITATION.--The year's precipitation was below normal over approximately two-thirds of the Country. Much of the South, the western and lower portions of the Great Plains, and the central part of the Great Basin of the far West had less than 75 percent of normal and some sections in these areas had less than 50 percent. In South Carolina, northern Florida, and southern portions of Alabama and Georgia the year was the driest on record. For the period June through September Spartanburg, S. C., had a total of only 3.76 inches which was 12.31 inches below normal. The yearly total of 28.66 inches at the Weather Bureau Office in Pensacola, Fla., represented a deficiency of 32.94 inches or only 47 percent of normal. In parts of the Southeast heat and drought cut early crops 50 percent or more.

Precipitation was above normal in regions near the Canadian Border, along the West Coast, in scattered sections of the far Southwest, and in the southern portion of the Florida Peninsula. In most of these areas precipitation fell at timely intervals throughout the year.

Snowfall was below normal in most areas where snow is a common occurrence. Heavy falls were relatively fewer and less extensive than is normally the case, thereby causing little interference to transportation. The cover, however, was generally adequate to protect winter grains and pastures from severe freezes, particularly the one on January 20-21 when 40-below-zero-minima occurred in several sections of the North Central Interior.

TEMPERATURE.--Average temperatures for 1954 were normal or slightly below in Pacific coastal areas from Santa Maria, Calif., to the State of Washington and thence eastward along the Canadian Border to the Continental Divide, in the Florida Peninsula, and a few other small scattered localities in the Atlantic Coastal States, and above normal elsewhere. Plus anomalies exceeded 2° in much of the central and lower Rocky Mountain State area, the central and lower Great Plains, and the central Mississippi Valley.

January, February and April were mild months, while March and May were rather cold. In the southern two-thirds of the Country a period of unusually hot weather began at mid-June and persisted until mid-October. Numerous all-time-high temperatures occurred in the area in June and July and many seasonal records in August, September, and October. The number of days with maxima above 100° also set new records at many stations. Following a break in the heat wave in mid-October temperatures followed a more nearly normal pattern during the remainder of the year.

DESTRUCTIVE STORMS.--During 1954 hurricanes accounted for 193 deaths and $755,472,500 damage, tornadoes 35 deaths and $28,367,400 damage, other windstorms 99 deaths and $30,700,900 damage, and hailstorms $72,695,600 damage - a total of 327 deaths and $887,236,400 damage to property and crops. The dollar value of losses for both hurricanes and hail set new annual records. (Details on these storms appear elsewhere in this publication.

Table 1

AVERAGE TEMPERATURE

Section	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Alabama	47.7	52.7	54.6	67.8	66.4	79.2	82.8	83.7	78.7	65.8	51.5	45.4	64.7
Arizona	43.4	50.7	49.0	62.2	67.8	74.1	81.1	76.6	74.0	64.2	53.5	43.1	61.6
Arkansas	41.5	50.7	50.8	66.4	64.8	79.6	85.8	85.3	77.3	63.9	50.7	43.1	63.3
California	44.9	51.2	48.8	60.1	65.5	68.1	76.7	71.3	68.8	61.3	53.5	44.1	59.5
Colorado	29.4	37.4	33.3	49.5	54.3	64.4	71.2	66.9	61.3	49.5	39.5	27.2	48.7
Connecticut	24.8	35.0	37.7	48.7	55.1	66.7	69.7	67.1	60.8	56.2	41.2	31.2	49.5
Delaware	34.8	41.7	43.6	56.7	61.0	72.1	76.1	73.6	69.1	60.9	44.7	36.6	55.9
Florida	61.5	62.1	63.8	73.8	74.5	80.7	81.8	83.4	80.8	72.3	63.0	57.0	71.2
Georgia	49.9	53.5	56.2	68.3	67.2	79.2	82.5	82.7	78.3	66.2	52.4	46.7	65.3
Idaho	28.6	34.0	33.9	45.5	55.1	57.3	69.3	64.0	57.7	45.6	39.9	24.7	46.3
Illinois	29.6	40.4	38.5	58.0	59.0	76.3	79.3	75.4	70.8	56.3	43.3	33.0	55.0
Indiana	30.9	39.8	38.1	56.9	57.5	74.7	76.9	73.7	69.5	56.3	42.5	32.5	54.1
Iowa	19.0	37.0	32.4	52.7	55.6	72.9	77.4	72.1	66.3	51.7	41.5	28.1	50.6
Kansas	29.9	46.0	41.3	60.1	59.9	77.0	85.6	81.6	75.2	58.2	47.5	36.3	58.2
Kentucky	36.7	44.7	44.7	61.9	60.4	75.1	79.2	77.5	72.7	59.2	45.1	36.9	57.8
Louisiana	53.2	58.1	58.5	70.6	69.6	81.0	83.8	83.8	79.3	69.7	56.6	52.5	68.1
Maine	14.6	26.5	29.2	40.9	50.9	61.5	65.2	63.8	55.7	49.6	36.7	24.7	43.3
Maryland	34.0	41.1	43.1	57.5	60.6	72.0	75.9	73.4	69.9	60.1	43.7	35.5	55.6
Massachusetts	24.0	33.9	36.6	47.7	54.4	65.1	69.0	66.6	60.0	55.8	41.8	31.7	48.9
Michigan	19.9	30.0	28.5	45.1	49.9	66.5	67.5	66.0	59.8	49.5	38.6	25.7	45.6
Minnesota	3.8	27.4	24.3	41.9	49.7	66.0	70.3	66.6	57.2	45.0	35.2	20.9	42.4
Mississippi	48.5	54.5	55.7	68.7	67.2	80.5	83.7	84.6	78.6	66.9	53.3	47.1	65.8
Missouri	31.9	44.5	42.6	62.0	60.8	77.2	84.2	80.1	73.7	58.6	46.4	36.4	58.2
Montana	12.2	34.8	25.2	39.3	51.2	56.5	69.2	64.2	55.1	43.6	40.2	27.9	43.3
Nebraska	23.7	41.7	33.4	52.9	56.1	71.8	80.3	74.4	68.0	50.8	43.1	32.0	52.4
Nevada	33.9	41.2	38.7	53.2	61.5	64.0	74.9	68.6	62.5	52.4	44.0	31.2	52.2
New Hampshire	16.9	28.1	30.8	43.8	52.2	63.5	65.8	63.2	56.4	51.3	37.5	25.3	44.6
New Jersey	29.7	38.7	41.0	53.1	58.3	69.9	74.0	71.4	66.0	59.0	43.1	34.4	53.2
New Mexico	37.3	44.0	43.8	57.7	61.7	70.7	75.5	71.7	68.0	57.4	45.8	36.5	55.8
New York	19.7	30.5	32.1	46.9	53.8	66.3	67.9	65.6	59.8	53.5	38.8	26.1	46.8
North Carolina	42.6	47.4	49.9	63.2	63.3	75.1	78.3	78.0	73.6	62.7	47.7	40.2	60.2
North Dakota	-0.9	30.4	23.0	39.1	50.0	61.4	70.4	66.4	55.4	44.0	35.7	23.2	41.5
Ohio	31.0	38.1	37.4	56.4	56.7	72.0	73.3	71.3	67.9	56.0	41.8	31.9	52.8
Oklahoma	39.0	51.9	49.1	66.6	64.3	79.5	88.8	86.5	79.5	65.1	52.1	42.9	63.8
Oregon	34.2	39.6	38.6	47.1	54.9	56.0	64.9	61.3	57.1	48.2	44.1	33.0	48.3
Pennsylvania	27.4	35.6	37.0	53.0	56.2	68.7	71.2	68.9	64.5	55.6	40.4	30.5	50.8
Rhode Island	27.2	35.9	37.8	47.8	54.6	65.3	68.8	66.9	61.3	57.3	43.4	33.7	50.0
South Carolina	47.6	51.6	54.0	66.5	66.5	78.5	81.9	82.0	77.3	65.4	50.9	44.1	63.9
South Dakota	13.4	37.8	27.5	46.4	53.4	65.2	76.2	71.4	61.7	46.8	40.5	26.7	47.3
Tennessee	40.3	47.2	48.1	63.9	61.9	75.9	81.5	80.2	74.6	60.8	46.7	39.4	60.0
Texas	49.2	56.5	56.6	69.7	70.1	81.1	85.4	84.3	79.9	69.0	56.1	51.1	67.4
Utah	30.3	36.1	37.0	51.5	59.5	63.7	74.0	68.6	62.3	51.1	41.2	26.9	50.2
Vermont	13.9	26.1	29.1	43.2	52.6	63.8	65.1	62.9	56.1	50.9	36.8	23.1	43.6
Virginia	37.2	43.1	45.4	59.8	60.7	72.4	75.9	74.7	71.3	60.0	43.9	36.3	56.7
Washington	29.7	37.4	38.5	45.4	55.0	56.8	63.4	62.2	58.2	47.7	44.7	33.9	47.7
West Virginia	33.8	39.7	40.5	57.9	57.2	70.0	72.4	71.5	67.5	55.9	41.5	32.7	53.4
Wisconsin	14.4	29.4	27.5	45.7	50.2	67.7	69.9	66.4	59.0	47.3	36.5	22.8	44.7
Wyoming	24.2	33.2	26.5	43.5	51.3	59.3	70.9	65.3	57.9	44.3	37.7	24.2	44.9
Alaska	-3.8	-7.1	13.4	22.9	41.2	50.4	52.8	52.5	43.1	31.4	17.7	-7.2	25.6
Hawaii	68.0	69.3	67.7	70.8	70.5	73.7	73.4	74.7	74.4	73.9	73.1	69.3	71.6
Puerto Rico	73.1	72.9	74.2	75.1	77.6	78.1	77.4	79.1	78.1	76.8	75.5	73.8	76.0

Table 2

DEPARTURES FROM NORMAL TEMPERATURE

Section	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Alabama	0.8	3.6	-1.3	4.2	-5.0	0.7	2.5	3.9	3.2	0.9	-2.7	-2.2	0.7
Arizona	2.9	5.7	-1.4	4.3	2.0	-.3	.9	-1.7	1.3	2.4	3.7	.2	1.6
Arkansas	.3	7.0	-1.6	4.8	-4.3	2.5	5.3	5.3	3.2	1.0	-.5	.3	1.9
California	1.1	4.1	-2.6	3.1	2.4	-1.5	1.0	-3.2	-.9	.3	1.5	-1.5	.3
Colorado	6.1	10.1	-1.1	5.6	1.7	2.9	3.8	1.0	2.9	2.0	4.6	1.2	3.4
Connecticut	-2.3	8.0	1.9	2.2	-2.4	.6	-.4	-1.9	-1.8	4.0	.2	1.0	.7
Delaware	-.8	6.8	.0	3.9	-2.2	.5	.0	-.8	.6	3.3	-2.0	-.2	.8
Florida	2.2	1.4	-1.6	3.8	-1.2	.7	.5	1.9	1.4	-.6	-1.9	-2.9	.3
Georgia	1.6	3.6	-.8	4.2	-4.9	.5	2.2	2.8	2.6	.8	-2.8	-1.6	.7
Idaho	5.1	6.0	-1.8	.3	1.9	-3.0	.9	-2.6	.4	-1.8	4.6	-1.6	.7
Illinois	1.9	10.5	-2.5	5.5	-3.7	4.2	2.9	.8	3.1	.4	1.1	1.8	2.2
Indiana	2.2	9.2	-2.4	5.7	-4.5	3.5	1.3	.0	2.2	1.1	.3	.8	1.6
Iowa	-.7	14.4	-3.3	3.8	-4.8	3.3	2.5	-.5	2.0	-.8	4.1	3.7	2.0
Kansas	-.4	12.0	-2.8	5.6	-3.9	3.2	6.0	3.3	5.2	.5	3.7	3.4	3.0
Kentucky	.6	7.2	-1.7	5.7	-4.9	1.1	2.1	1.7	2.5	.7	-1.2	-.9	1.0
Louisiana	1.5	3.4	-1.3	3.3	-4.2	.6	1.6	1.5	1.2	.6	-1.8	-.4	.5
Maine	-2.6	8.1	.1	.0	-1.6	-.1	-1.9	-1.9	-2.1	1.7	1.5	2.4	.3
Maryland	.4	7.3	.3	5.1	-2.2	1.1	.6	.0	2.4	3.7	-1.5	.2	1.4
Massachusetts	-2.6	7.3	1.4	2.2	-2.1	-.2	-1.5	-2.0	-2.1	3.9	.8	1.5	.6
Michigan	-.2	9.9	-1.1	2.6	-4.0	2.6	-1.5	-1.1	-.2	.7	2.6	1.0	1.0
Minnesota	-5.0	15.1	-1.6	-.4	-5.2	1.6	.5	-.6	-1.3	-1.0	5.8	5.6	1.2
Mississippi	.9	4.8	-1.2	4.1	-4.6	1.5	2.6	3.7	2.8	1.4	-1.7	-1.2	1.1
Missouri	1.1	10.8	-1.9	6.6	-3.8	3.9	6.5	3.6	4.4	.9	1.8	2.5	3.0
Montana	-6.3	13.8	-5.6	-4.1	-1.7	-4.0	.8	-1.8	-.9	-1.9	8.3	4.9	.1
Nebraska	.5	15.1	-3.0	3.6	-3.2	2.5	4.9	1.1	3.7	-1.2	5.8	4.9	2.9
Nevada	3.2	6.1	-2.8	4.0	4.5	-1.2	1.4	-2.9	-.3	.6	3.4	-1.5	1.2
New Hampshire	-2.4	8.2	1.7	1.7	-1.8	.4	-2.3	-2.3	-2.0	3.7	1.9	1.9	.8
New Jersey	-1.4	7.6	1.5	3.2	-2.3	.7	.0	-.7	.1	4.0	-.9	.6	1.0
New Mexico	3.6	5.6	-.4	5.0	.7	1.0	2.0	-.3	2.4	2.2	2.8	.8	2.1
New York	-2.9	8.2	.5	2.9	-2.0	1.6	-1.4	-1.6	-1.0	3.4	1.1	-.1	.8
North Carolina	.2	3.9	-.6	4.5	-4.1	.3	.9	1.7	2.2	2.0	-2.8	-2.8	.5
North Dakota	-7.8	19.9	-1.7	-2.2	-3.9	-1.7	.8	-.6	-1.7	.0	8.3	9.2	1.5
Ohio	1.7	7.8	-1.7	6.5	-3.9	2.2	-.4	-.4	2.3	2.1	.2	.2	1.4
Oklahoma	1.0	9.2	-1.7	6.1	-3.9	1.9	6.5	4.6	5.3	2.0	2.2	2.3	3.0
Oregon	2.5	3.8	-3.2	-.8	.9	-3.8	-2.0	-4.3	-1.6	-2.1	3.9	-1.3	-.6
Pennsylvania	-1.2	6.9	-.7	4.3	-3.4	.5	-1.0	-1.3	.5	2.8	-.9	-.8	.5
Rhode Island	-2.5	6.7	1.1	2.0	-1.3	.6	-1.6	-2.3	-2.0	3.8	.2	.6	.4
South Carolina	1.3	3.6	-.9	4.0	-4.5	.6	2.0	3.1	2.7	1.2	-2.9	-2.6	.7
South Dakota	-3.7	18.5	-3.8	.4	-3.0	-.9	3.1	.3	.1	-2.1	7.4	4.7	1.8
Tennessee	.8	5.7	-1.4	5.2	-5.0	.9	3.6	3.4	3.2	.9	-1.7	-1.4	1.1
Texas	2.2	6.0	-1.0	4.5	-2.4	1.5	3.0	2.1	3.6	2.2	.4	3.1	2.1
Utah	5.5	6.0	-1.2	4.5	3.8	-.8	2.1	-1.3	1.5	1.7	4.1	-.2	2.2
Vermont	-4.0	7.7	.2	1.6	-1.4	.6	-2.7	-2.4	-2.0	3.7	1.8	.8	.3
Virginia	.5	5.6	-.3	5.1	-3.5	.5	.6	.7	2.8	2.5	-2.9	-1.6	.8
Washington	-1.1	2.8	-3.0	-3.2	-.3	-4.0	-3.3	-3.8	-.7	-2.4	4.8	.3	-1.2
West Virginia	.7	5.9	-1.9	5.9	-4.5	.1	-.7	-.3	1.4	1.0	-1.7	-1.9	.3
Wisconsin	.1	12.8	-1.0	2.7	-5.0	2.9	-.2	-1.0	-.9	-.5	3.5	2.7	1.3
Wyoming	5.6	11.0	-3.4	2.6	1.3	.6	4.5	.7	2.7	-.1	6.4	1.9	2.9
Alaska	-4.0	-10.9	3.1	-1.5	2.7	.1	-1.4	1.6	.6	2.2	4.5	-10.0	-1.1
Hawaii	-.5	.5	-1.0	.7	-.9	.2	-.3	.2	.1	.2	1.2	-.7	.0
Puerto Rico	.4	.3	.6	-.2	.7	.0	.3	.4	-.5	-1.0	-.5	-.5	.0

DEPARTURES FROM NORMAL ANNUAL TEMPERATURE

(For past years)

Table 3

Section	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954
Alabama	1.0	2.0	0.7	1.0	1.1	0.5	1.8	1.2	-1.5	0.8	-0.3	0.5	1.0	1.2	1.4	-0.2	0.7	1.2	0.1	0.6	0.1	0.5	0.7
Arizona	-.9	-.4	2.4	-.5	.9	-.4	-.3	.1	1.1	-1.5	-.6	.9	-1.4	-.5	.3	.3	-.4	-.9	1.3	-.2	-.4	.0	1.6
Arkansas	.6	1.8	1.4	.0	.6	-.3	2.2	1.3	-2.1	.5	-.4	.2	.3	-.6	1.2	-.6	-1.0	-.1	-1.2	-.9	.2	1.0	1.9
California	-1.1	-1.4	1.5	-1.2	.6	-.8	-.7	.2	.7	-.4	-.6	.4	-1.2	-.5	-1.0	-.1	-1.6	-1.3	.6	-.2	-.6	-.1	.3
Colorado	-.2	1.6	4.3	1.4	1.7	.7	1.4	1.5	1.3	.6	-.2	1.3	-.3	-.1	1.1	.2	-.6	.2	.9	-.8	.2	1.6	3.4
Connecticut	1.6	1.0	-.2	-.3	.2	1.3	1.5	.3	-2.3	.4	.4	-.7	.2	.2	.8	-.3	-.2	2.8	.1	1.4	1.7	2.8	.7
Delaware	1.6	1.3	-.3	-.5	.1	.4	1.3	1.2	-2.3	.7	.4	.1	.1	.2	1.1	-.4	-.2	2.2	-.4	.4	.6	1.7	.8
Florida	1.1	1.2	.1	.0	.1	-.1	.3	.7	-1.7	.0	-.3	-.3	.4	1.0	1.5	.5	1.8	1.7	.7	.6	.5	1.1	.3
Georgia	1.2	1.7	.1	.4	.5	.0	1.1	1.0	-1.7	.5	-.4	-.1	.1	.6	1.0	-.8	.6	1.2	-.1	.3	.5	.5	.7
Idaho	-1.5	-.5	4.3	-.6	.2	-.8	.9	1.4	2.3	1.0	-1.0	-.1	-.8	-.3	.0	.6	-1.2	-.8	-.2	-1.1	-.7	1.6	.7
Illinois	.7	2.3	1.8	-.1	.5	-.8	2.7	1.9	-.8	2.0	.3	-.4	.9	-.7	2.3	-.2	.1	1.2	-1.5	-1.5	1.2	2.2	2.2
Indiana	.7	2.1	1.2	-.1	.3	-.7	2.3	1.7	-1.1	1.7	.3	-.4	1.1	-.5	2.1	-.7	.2	1.4	-1.4	-1.2	1.1	1.9	1.6
Iowa	.0	2.6	3.3	.4	.4	-.7	3.0	2.9	-.3	2.9	.7	-.3	1.1	-.5	2.5	.7	.4	.6	-2.6	-3.0	.5	1.8	2.0
Kansas	-.3	2.8	3.5	.9	1.3	-.4	2.9	2.8	-.4	1.2	.0	.4	.1	-.4	2.8	.2	-.4	-.4	-1.1	-2.2	.6	2.1	3.0
Kentucky	1.0	1.7	.9	.1	.7	-.4	1.9	1.2	-1.9	.9	-.1	-.1	.7	.0	1.5	-1.0	.1	1.2	-1.0	-.5	.9	1.2	1.0
Louisiana	.5	2.2	.8	.8	.0	-.1	1.0	1.0	-1.8	.2	-.8	-.2	.4	.4	.8	-.6	.1	.7	.6	.6	-.1	.7	.5
Maine	2.2	.7	-.2	.2	.5	3.0	2.2	-.2	-.6	1.2	1.3	-.7	1.0	.7	1.1	1.3	.3	2.7	.8	1.6	1.6	2.9	.3
Maryland	1.0	.8	-.2	-.5	.2	.0	1.3	1.3	-1.8	.9	.7	.3	.4	.6	1.7	.2	.5	2.7	.6	1.0	1.4	2.6	1.4
Massachusetts	1.1	.6	-.4	-.4	.1	1.3	1.4	.1	-1.7	.8	.4	-.8	.3	.5	1.2	.7	.1	3.1	.4	1.3	1.6	2.6	.6
Michigan	.9	1.2	.2	-.5	-.7	.1	1.8	.9	-1.0	1.8	.4	-1.4	1.0	-.4	.7	.2	.4	2.1	-1.4	-.7	1.5	2.6	1.0
Minnesota	-.4	.6	1.4	-.5	-2.0	-1.3	1.8	1.9	-.1	2.5	.9	-.9	1.5	-1.0	.7	-.1	.2	.5	-4.0	-2.6	1.4	2.0	1.2
Mississippi	.5	2.1	.9	.5	.3	.1	1.6	.9	-2.3	.5	-.5	.3	.6	.4	.9	-.8	-.1	1.1	.1	.5	.1	.6	1.1
Missouri	.4	2.1	2.2	-.2	1.1	-.7	3.2	2.2	-1.2	2.0	.3	-.1	.7	-.5	2.6	.2	.0	.5	-.6	-1.4	1.2	2.7	3.0
Montana	-.4	1.0	3.9	-.5	-.3	-1.1	1.2	2.3	1.7	1.8	-.1	-.4	.2	-.2	.8	.3	-.6	-1.0	-2.9	-3.7	-.3	2.2	.1
Nebraska	-.3	2.6	3.9	.7	.4	-.4	2.8	3.1	.6	1.7	.3	1.0	-.2	-.3	2.4	.3	.3	-.2	-1.5	-2.3	.8	2.4	2.9
Nevada	.1	.6	4.6	1.0	2.4	.8	.9	1.9	2.7	.6	1.0	2.0	-1.0	.5	1.3	1.5	-.6	-.8	.7	-5.6	-.8	.7	1.2
New Hampshire	.6	-.5	-1.4	-1.4	-.8	.7	1.0	-1.1	-1.9	.1	.6	-1.1	.0	.5	.9	.4	-.7	2.6	-.6	.9	1.7	3.2	.8
New Jersey	1.4	.9	-.4	-.4	.3	1.0	1.3	1.0	-1.9	1.0	.6	.0	.5	.6	1.9	.5	.3	3.1	.2	1.2	1.4	2.4	1.0
New Mexico	-1.0	.3	2.4	.0	.0	-.2	-.1	.0	.2	-.7	-.1	1.0	-.9	.1	.9	.0	.4	-.5	1.8	-.5	.2	.6	2.1
New York	1.3	1.3	-.4	-.6	.2	1.1	1.6	.5	-1.8	1.2	.8	-.8	.4	.3	1.6	.4	.2	2.6	-.3	.2	1.0	2.7	.8
North Carolina	1.2	1.8	.3	.1	.2	.1	1.1	1.2	-1.5	.6	.1	.1	.0	.7	.5	-.6	.8	2.2	.5	.5	1.1	1.2	.5
North Dakota	.4	1.5	3.8	-.2	-.8	-.5	2.3	2.3	1.4	2.6	1.3	.2	1.4	-.6	1.2	.5	.4	.2	-4.3	-3.7	1.4	2.8	1.5
Ohio	1.4	2.0	1.0	.1	.4	-.1	2.4	1.9	-1.2	1.8	.7	-.3	.9	-.2	1.9	-.2	.5	2.7	-.7	.0	1.5	2.2	1.4
Oklahoma	.1	2.5	2.5	.3	1.3	-.3	2.3	2.2	-1.1	.5	-.3	.5	.4	-.6	2.0	-.1	-.9	-.9	-.9	-.6	.8	1.5	3.0
Oregon	-.2	-.8	3.1	-.4	.5	-.3	.5	1.1	1.8	1.4	.2	-.2	-.2	-.3	-1.0	.2	-1.7	-1.0	-.6	-.5	-.4	.6	-.6
Pennsylvania	1.4	1.5	.4	.0	.2	.5	1.6	1.5	-1.6	1.1	.3	-.7	-.2	-.5	.9	-.6	-.3	2.0	-.9	.1	.8	1.8	.5
Rhode Island	1.3	.7	-.2	.1	.4	1.8	1.4	.3	-1.6	.6	.5	-.4	.5	.2	1.0	.3	-.3	3.0	.5	2.0	2.0	2.3	.4
South Carolina	1.5	1.8	.2	.2	.2	-.2	1.0	1.2	-1.6	.2	.2	-.2	-.1	.9	1.0	-.7	.0	1.1	-.2	-.1	.3	.8	.7
South Dakota	-.3	2.5	4.1	.9	-.4	-.9	2.4	3.0	.6	2.4	.6	.4	-.1	-.6	1.8	.2	.2	-.1	-3.4	-3.5	.4	1.8	1.8
Tennessee	1.5	2.2	1.1	.8	.9	.2	2.0	1.4	-1.6	1.4	.2	.3	.8	.3	1.7	-.5	.1	1.1	-.6	.0	.7	1.2	1.1
Texas	-.6	2.1	1.8	.3	-.7	-.4	1.1	.8	-1.5	-.5	-.9	-.3	-.2	.1	.7	-.8	-.3	-1.3	-.2	1.0	.5	1.2	2.1
Utah	-1.5	-.2	4.2	.7	1.1	-.4	.6	.9	2.2	-.2	-.7	1.5	-1.3	-.4	.7	.3	-.8	-1.1	.6	-.3	-.3	1.4	2.2
Vermont	1.2	.9	-.6	-1.9	-.1	1.5	1.4	-.5	-1.3	.6	1.0	-1.4	-.1	.5	.8	.5	.0	2.2	.1	.8	-1.2	3.0	.3
Virginia	1.6	1.7	.3	-.5	.1	-.2	1.1	1.3	-1.6	.9	.5	.3	.1	.5	1.1	-.6	.1	1.7	-.2	.4	.9	1.9	.8
Washington	-1.3	-1.6	2.3	-.6	.0	-.7	.3	.9	2.0	2.1	.6	-.3	.2	-.2	-.5	.4	-2.5	-1.4	-2.0	-1.0	-.1	1.1	-1.2
West Virginia	1.0	1.4	.5	.0	.3	-.1	1.5	1.4	-1.6	.4	.0	-.5	.0	.0	1.4	-.4	.1	2.2	-.3	.1	.8	1.3	.3
Wisconsin	-.1	.9	1.2	-.5	-1.3	-.7	1.8	1.7	-.8	-2.4	.5	-.9	1.7	-.6	1.9	.4	.8	1.8	-2.3	-2.3	1.5	2.3	1.3
Wyoming	-1.4	1.3	3.9	.3	.5	-.5	1.1	1.6	1.7	1.1	-.2	1.6	-.5	-.2	2.1	.8	.4	.7	-.2	-1.3	.5	2.5	2.9

AVERAGE PRECIPITATION

Table 4

YEAR 1954

Section	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Alabama	4.09	3.16	3.61	3.48	2.24	2.08	3.51	1.75	1.12	1.37	3.08	4.87	34.36
Arizona	1.24	.57	2.42	.05	.46	.54	2.45	2.00	1.46	.36	.12	.31	11.98
Arkansas	6.08	2.24	2.06	4.00	5.43	1.28	1.55	1.53	2.62	4.97	1.37	4.75	37.88
California	5.60	2.96	4.21	1.61	.12	.58	.13	.33	.16	.26	2.72	3.63	22.31
Colorado	.49	.27	1.02	.47	1.45	.64	2.04	1.55	1.58	.97	.65	.58	11.71
Connecticut	2.25	2.08	3.88	4.40	4.03	1.97	2.99	6.20	8.02	2.43	6.02	5.18	49.45
Delaware	2.58	1.43	3.93	3.77	3.85	.95	3.06	5.11	4.09	2.23	4.16	3.43	38.59
Florida	.99	2.02	2.43	3.47	4.64	5.73	7.59	4.55	6.62	3.17	2.95	1.73	45.89
Georgia	2.66	2.06	3.22	2.49	2.78	2.65	3.50	2.91	1.94	.95	3.00	3.15	31.31
Idaho	2.81	1.23	1.52	1.37	.87	2.19	.58	.91	.54	.66	1.22	1.34	15.24
Illinois	1.66	1.84	2.56	4.15	2.77	3.56	2.79	5.04	2.03	5.22	1.23	2.74	35.53
Indiana	2.80	2.46	2.67	3.74	2.75	2.91	3.24	4.93	1.74	6.30	1.51	2.76	37.81
Iowa	.26	1.46	1.79	4.42	3.89	6.36	1.79	7.10	1.42	4.19	.25	.72	34.42
Kansas	.12	.83	.59	1.94	4.43	2.47	1.50	3.64	1.42	2.52	.03	.55	20.04
Kentucky	5.32	2.23	2.73	3.73	3.12	3.00	2.86	4.29	3.96	2.84	1.89	4.85	40.18
Louisiana	4.07	1.34	2.27	3.22	6.82	2.07	6.04	1.86	2.87	3.84	2.51	3.29	40.20
Maine	3.06	4.09	3.47	4.09	5.70	5.35	3.73	5.67	8.51	4.61	4.45	5.07	57.80
Maryland	2.54	1.26	3.87	3.40	2.86	1.73	2.45	5.03	1.87	3.76	2.58	3.10	34.45
Massachusetts	3.02	2.83	3.49	4.45	7.05	2.90	2.57	5.78	7.86	2.59	5.56	4.98	53.08
Michigan	1.64	2.35	2.62	4.14	2.38	5.13	2.14	1.87	3.98	5.73	1.78	1.61	35.37
Minnesota	.79	.85	1.31	2.96	3.33	3.73	3.09	2.80	3.27	1.69	.58	.27	24.67
Mississippi	5.29	2.44	3.04	3.99	5.72	1.86	3.85	1.43	2.13	2.60	2.96	4.46	39.77
Missouri	1.73	1.72	2.03	3.78	4.37	3.21	1.40	5.06	2.47	5.35	.84	3.37	35.33
Montana	1.42	.62	1.20	1.04	1.26	2.86	.93	2.40	1.62	.81	.31	.31	14.78
Nebraska	.09	.72	1.08	1.62	3.27	3.59	1.27	4.42	1.41	1.76	.16	.22	19.61
Nevada	.94	.58	1.27	.50	.14	.65	.41	.10	.32	.16	.63	.68	6.38
New Hampshire	2.75	3.17	3.83	4.40	8.07	4.75	3.25	4.54	7.84	2.81	4.94	4.00	54.35
New Jersey	2.07	1.84	3.75	3.46	3.93	1.12	1.70	6.85	5.66	2.25	5.27	3.69	41.59
New Mexico	.34	.10	.70	.30	1.42	.49	1.83	2.60	1.35	1.69	.08	.24	11.14
New York	2.74	3.13	3.52	4.30	3.60	3.73	2.11	4.41	3.84	3.15	4.41	3.82	42.76
North Carolina	6.20	2.25	5.04	2.81	4.08	1.98	4.24	3.97	1.66	3.63	2.89	3.63	42.38
North Dakota	.71	.23	.84	1.22	2.05	4.94	1.92	2.74	3.04	.61	.21	.09	18.60
Ohio	2.53	1.60	3.68	3.90	2.12	3.43	3.36	4.85	1.55	5.63	1.48	2.36	36.49
Oklahoma	1.00	.55	.72	3.53	6.24	1.50	.61	1.84	.97	3.05	.24	2.18	22.51
Oregon	6.54	2.56	2.20	2.05	1.20	2.28	.34	1.11	.95	1.63	2.57	3.67	27.10
Pennsylvania	2.10	1.89	4.14	4.06	3.36	3.06	2.34	5.33	2.70	5.36	2.90	3.43	40.67
Rhode Island	2.87	2.72	3.40	5.00	5.53	1.64	3.15	9.02	7.05	2.39	4.90	5.97	53.64
South Carolina	3.44	1.57	3.59	2.89	3.37	1.85	3.64	2.50	1.63	3.33	2.12	3.02	32.95
South Dakota	.19	.53	1.59	1.19	2.42	4.30	1.38	2.21	1.51	1.49	.38	.16	17.35
Tennessee	9.85	3.70	4.04	4.02	3.71	2.54	2.40	2.46	2.48	2.25	2.32	6.03	45.80
Texas	1.02	.31	.41	2.88	3.71	1.61	.91	1.43	1.01	3.03	1.15	.83	18.30
Utah	1.24	.55	1.61	.55	.85	.83	.80	.57	1.60	.85	.96	.82	11.23
Vermont	2.79	3.58	3.74	4.09	5.16	4.53	3.08	3.77	5.62	2.74	4.53	3.42	47.05
Virginia	4.04	1.68	3.97	2.66	4.20	2.12	3.67	3.85	1.48	5.07	2.80	3.41	38.95
Washington	7.08	4.05	1.98	2.29	1.34	2.21	1.11	1.68	1.60	2.04	5.44	4.16	34.98
West Virginia	3.30	1.45	4.24	3.06	3.60	3.65	5.88	6.74	2.72	5.83	1.86	3.56	45.89
Wisconsin	.71	.80	1.57	5.26	3.79	6.03	3.88	2.92	5.30	3.93	.98	.79	35.96
Wyoming	.74	.47	1.59	.59	1.33	1.26	.98	.82	.64	.75	.36	.50	10.03
Alaska	1.38	1.41	1.49	.54	.95	1.41	2.80	2.84	3.09	2.29	2.17	1.89	22.19
Hawaii	3.60	5.56	8.05	4.72	6.93	4.62	8.60	7.33	3.80	3.84	6.98	17.43	81.46
Puerto Rico	2.61	5.39	2.17	4.02	4.99	6.42	5.90	7.44	12.40	13.16	4.93	2.07	71.50

Table 5

PERCENT OF NORMAL PRECIPITATION

YEAR 1954

Section	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Alabama	81	60	60	77	58	49	64	38	33	55	90	97	65
Arizona	125	45	247	8	144	154	147	95	105	44	17	24	95
Arkansas	137	62	43	81	106	31	41	43	79	154	36	113	78
California	141	74	126	95	14	193	130	220	46	20	118	91	100
Colorado	53	27	75	27	83	44	101	82	114	79	78	62	71
Connecticut	59	61	94	117	105	56	76	150	206	70	156	134	108
Delaware	72	45	102	106	77	25	66	106	120	73	138	96	85
Florida	37	66	73	113	121	86	102	64	96	75	132	62	86
Georgia	66	45	65	66	81	60	60	56	50	36	113	75	63
Idaho	140	72	90	100	55	166	95	157	55	46	63	68	09
Illinois	71	96	78	117	67	89	86	150	56	196	47	127	96
Indiana	93	103	72	104	67	73	97	148	53	227	50	102	96
Iowa	26	134	106	169	98	140	50	189	55	183	15	66	110
Kansas	2	85	42	76	118	62	51	117	48	124	0	65	75
Kentucky	116	64	57	94	78	72	69	115	136	110	55	126	90
Louisiana	72	29	41	67	133	46	109	41	76	121	53	60	70
Maine	91	138	99	129	174	153	111	173	234	128	123	151	142
Maryland	76	44	107	97	77	44	58	114	55	126	94	98	82
Massachusetts	81	84	89	124	201	83	74	157	212	77	149	137	123
Michigan	91	143	128	172	72	150	78	64	121	216	71	83	115
Minnesota	105	113	109	144	106	91	93	85	116	92	49	35	98
Mississippi	101	49	51	82	131	45	77	35	69	105	78	84	75
Missouri	75	82	62	94	91	67	40	134	62	182	31	155	87
Montana	195	102	140	91	63	102	67	216	127	82	40	41	102
Nebraska	16	104	96	68	95	94	41	163	67	120	21	31	86
Nevada	89	57	140	64	18	125	105	20	76	25	98	72	74
New Hampshire	91	118	115	140	239	130	88	129	210	90	145	128	137
New Jersey	57	54	98	96	101	30	36	145	153	65	153	102	91
New Mexico	55	16	103	39	119	41	81	112	74	149	15	33	80
New York	96	119	112	142	99	104	55	122	110	98	143	129	109
North Carolina	168	58	121	81	104	43	71	72	41	114	103	98	86
North Dakota	148	49	108	86	90	141	78	132	199	59	34	19	109
Ohio	85	68	106	120	57	87	89	146	53	225	55	87	97
Oklahoma	65	34	32	100	129	39	22	63	31	103	12	126	67
Oregon	169	77	76	100	69	159	77	252	80	73	66	86	98
Pennsylvania	66	68	116	116	83	75	55	131	80	169	97	110	96
Rhode Island	72	78	83	131	159	56	108	235	210	71	129	154	125
South Carolina	100	39	89	89	97	40	62	44	39	118	91	84	70
South Dakota	35	95	143	57	85	119	57	104	97	123	58	31	90
Tennessee	192	82	75	93	90	60	54	63	78	81	63	132	91
Texas	64	20	23	115	109	58	36	61	35	124	63	41	66
Utah	106	44	118	44	78	119	83	51	154	70	103	75	85
Vermont	100	143	127	138	153	122	81	107	151	86	141	122	122
Virginia	122	56	109	81	110	52	80	86	46	172	109	110	93
Washington	162	115	66	106	71	137	171	237	98	73	162	84	109
West Virginia	90	47	108	87	89	81	128	165	91	210	66	109	106
Wisconsin	57	67	97	213	108	144	113	85	142	165	52	63	119
Wyoming	88	60	147	37	67	69	78	79	53	65	45	65	70

PERCENT OF ANNUAL PRECIPITATION

Table 6

(For past years)

Section	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954
Alabama	80	119	90	103	92	114	109	91	111	101	86	100	89	112	106	124	114	125	106	98	100	89	111	65
Arizona	142	98	86	76	112	103	94	92	93	125	153	69	90	99	82	100	69	77	97	54	115	112	62	95
Arkansas	97	105	101	88	118	72	114	100	104	93	96	103	72	114	139	121	84	115	117	122	109	88	89	78
California	102	65	84	75	92	84	121	125	66	150	151	100	100	100	114	73	57	88	70	124	111	132	72	100
Colorado	85	86	92	66	96	97	88	117	65	102	136	113	86	100	102	102	110	93	102	74	99	80	86	71
Connecticut	90	107	99	116	79	117	120	133	94	104	81	115	85	98	112	84	112	103	85	97	114	111	119	108
Delaware	93	112	119	124	124	115	115	111	104	99	77	102	88	101	125	90	95	131	92	92	102	116	109	85
Florida	81	100	104	99	98	108	110	81	102	98	110	100	90	100	104	103	137	118	102	91	90	91	128	86
Georgia	75	116	83	97	89	118	105	84	98	94	85	106	94	108	108	101	119	127	96	89	91	91	117	63
Idaho	83	108	103	89	68	91	110	108	76	121	119	111	92	89	121	114	101	118	86	115	112	78	100	89
Illinois	103	99	95	90	114	82	100	110	97	78	108	112	95	92	125	109	101	100	112	117	119	92	76	96
Indiana	98	109	104	76	100	86	117	105	99	83	83	105	95	86	127	92	102	105	115	138	109	98	79	96
Iowa	111	102	79	85	104	82	87	114	79	97	116	103	98	117	109	109	111	89	89	93	135	95	82	110
Kansas	96	88	82	74	106	68	77	101	75	95	137	123	91	139	112	105	102	109	120	101	156	70	79	75
Kentucky	93	109	112	82	127	84	110	102	105	86	74	110	83	89	113	101	92	111	114	139	119	91	80	90
Louisiana	94	111	97	105	101	81	104	89	91	132	107	101	92	109	109	130	112	100	109	101	87	88	119	70
Maine	100	99	102	99	95	123	105	107	89	100	76	100	106	95	115	92	91	93	89	107	126	95	120	142
Maryland	92	112	117	107	112	105	124	96	103	104	78	115	81	101	120	89	92	132	99	102	102	122	104	82
Massachusetts	101	107	115	105	92	119	114	129	88	102	76	110	90	97	117	95	95	106	81	93	112	97	124	123
Michigan	98	109	99	84	94	89	102	103	99	107	106	115	105	94	116	90	108	92	105	114	122	97	97	115
Minnesota	88	85	81	80	101	72	102	112	86	100	115	114	107	117	108	111	100	89	106	103	123	89	122	98
Mississippi	98	127	94	100	97	83	104	92	101	114	87	91	78	114	111	123	109	123	114	112	104	77	106	75
Missouri	100	94	93	87	119	73	92	101	94	80	104	114	94	96	132	109	98	98	119	102	125	81	63	87
Montana	67	107	107	77	72	77	87	109	83	99	114	110	98	101	97	113	106	110	83	107	110	74	112	102
Nebraska	85	91	90	63	100	64	78	98	72	77	108	111	76	121	100	109	103	94	112	100	137	91	89	86
Nevada	89	92	74	79	96	114	99	131	94	123	149	82	109	95	126	108	64	72	89	95	95	107	62	74
New Hampshire	104	108	114	107	102	131	123	125	98	111	83	109	112	101	125	105	103	100	93	106	125	106	114	137
New Jersey	81	103	109	100	93	104	104	115	94	106	82	111	86	103	115	87	101	116	87	97	109	120	107	91
New Mexico	126	112	89	70	102	93	104	101	91	104	195	108	80	101	69	93	76	93	107	74	69	78	69	80
New York	97	107	96	89	97	102	111	106	87	103	81	112	100	95	125	94	110	103	87	104	108	98	97	109
North Carolina	88	106	79	108	97	121	106	97	99	91	78	104	88	108	110	99	103	114	109	92	83	100	93	86
North Dakota	88	100	79	56	105	52	99	90	83	102	136	110	107	125	87	97	106	102	95	106	97	72	117	109
Ohio	101	98	102	70	107	88	118	104	99	101	83	101	94	88	118	95	108	111	99	126	110	93	76	97
Oklahoma	96	103	93	83	112	69	86	101	81	103	143	121	88	111	127	108	96	97	118	104	106	71	94	67
Oregon	93	101	107	98	78	88	132	100	79	112	113	118	91	76	121	104	102	132	86	135	114	83	133	98
Pennsylvania	89	93	108	93	96	101	111	96	88	104	81	114	90	96	117	94	98	109	91	113	105	111	97	96
Rhode Island	94	122	106	92	89	120	103	112	90	94	76	106	72	95	97	88	112	109	82	93	106	98	136	125
South Carolina	76	112	75	93	89	119	108	85	97	90	93	99	92	101	116	94	116	124	102	88	82	98	100	70
South Dakota	65	108	91	65	81	49	89	83	74	80	126	121	88	114	91	144	98	104	90	94	116	73	114	90
Tennessee	87	120	103	95	100	95	113	100	100	86	74	102	84	109	116	109	89	116	115	127	116	84	91	91
Texas	94	110	84	86	121	99	86	87	79	113	140	107	82	116	108	122	86	80	114	83	76	83	86	66
Utah	75	100	79	71	81	127	110	113	86	118	155	94	105	112	136	125	124	96	111	78	110	92	82	85
Vermont	104	104	102	101	100	121	117	120	96	109	83	107	110	98	133	104	111	104	91	99	114	102	100	122
Virginia	91	107	94	109	111	108	127	101	99	106	74	116	86	107	113	93	96	125	108	100	91	110	89	93
Washington	122	128	137	111	84	94	125	85	93	104	98	96	79	74	112	108	105	128	87	118	109	67	123	109
West Virginia	99	102	113	87	119	98	116	99	101	104	84	113	93	104	117	85	85	115	105	118	107	97	82	106
Wisconsin	97	84	89	100	99	83	90	136	86	107	111	115	96	95	115	97	98	79	92	101	126	95	99	119
Wyoming	81	93	85	76	86	92	109	107	72	102	127	108	87	109	122	109	117	89	96	96	98	78	83	70

EXCESSIVE PRECIPITATION

(Excessive Short Duration Rainfall)

YEAR 1954

This table contains statistics of maximum amounts of rainfall during the calendar year 1954. Data presented in this table are generally from stations equipped with recording gages. Stations are at City Office locations unless otherwise shown.

Excessive precipitation data for the years 1896-1935 inclusive, generally present the accumulated amounts of precipitation for each 5, 10, or 20 minute intervals during storms in which the rate of fall equaled or exceeded .25 inch in any 5 minute period, or .30 in any 10 minute period, or .35 in any 15 minute period, etc., the tabulation beginning with the 5 minute period where the rate of .05 inch in 5 minutes began and continuing by 10 or 20 minute intervals up to 120 minutes. A detailed explanation of the method used may be found in the publications listed in the last paragraph of this explanation.

The present method, adopted with data for the calendar year 1936, gives the maximum fall of precipitation for the periods 5 to 180 minutes, the maximum amounts being taken for the periods in which the fall is greatest for the given time, and is tabulated to show maximum amounts for 5, 10, 15, 20, 30, 45, 60, 80, 100, 120, 150 and 180 minutes, even if the fall does not equal the excessive rate for some of the periods. (The 15 minute amount was not computed for 1936-43 and the 150 minute amount was not computed for 1944 through 1948).

The following Table A shows limits at which precipitation was considered excessive in this publication:

TABLE A

Duration (minutes)	Depth of precipitation (inches)	Duration (minutes)	Depth of precipitation (inches)
5	.25	60	.80
10	.30	80	1.00
15	.35	100	1.20
20	.40	120	1.40
30	.50	150	1.70
45	.65	180	2.00

This table is made up from the formula, A = t + 20 where A is the accumulated depth in hundredths of inches and t is the time in minutes.

For the years 1936 through 1948 stations in North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Tennessee, Arkansas, Louisiana, Texas, Oklahoma, and San Juan, P. R. used the limits shown in the following Table B:

TABLE B

Duration (minutes)	Depth of precipitation (inches)	Duration (minutes)	Depth of precipitation (inches)
5	.40	60	1.50
10	.50	80	1.90
15	.60	100	2.30
20	.70	120	2.70
30	.90	150	3.30
45	1.20	180	3.90

This table is made up from the formula A = 2t + 30. Its use, however, was discontinued at the end of 1948 and Table A is used by all sections for 1949 and the following years.

Publication of Data. A summary of maximum precipitation data for the years prior to 1896 is published in the annual report of the Chief of the Weather Bureau for 1895-1896. Excessive precipitation data for the period 1881-1896 are published in the annual report of the Chief of the Weather Bureau 1896-1897. Data for the years 1897 through 1934 have been published in the appropriate annual reports of the Chief of the Weather Bureau. For the years 1935 through 1949 these data are published in the appropriate issue of the United States Meteorological Yearbook. For 1950 and succeeding years excessive precipitation are presented in the annual issues of the Climatological Data, National Summary.

EXCESSIVE SHORT DURATION RAINFALL

Table 8

YEAR 1954

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
ALABAMA												
Birmingham Airport												
Jan. 15	0.32	0.47	0.57	0.67	0.86	0.99	1.28	1.55	1.80	1.90	2.11	2.29
Feb. 16	.15	.29	.44	.49	.55	.58	.58	.58	.58	.58	.58	.58
Feb. 28	.18	.34	.44	.53	.66	.69	.71	.75	.83	.87	.90	.90
May 28	.26	.43	.53	.62	.79	1.04	1.10	1.36	1.42	1.65	1.67	1.67
June 2	.42	.72	.87	.98	1.10	1.11	1.13	1.16	1.17	1.17	1.17	1.17
July 2	.28	.56	.81	1.02	1.27	1.39	1.40	1.41	1.43	1.46	1.48	1.50
July 8	.41	.67	.82	.83	.83	.83	.83	.83	.83	.83	.83	.83
Aug. 8	.20	.35	.50	.59	.64	.64	.64	.64	.69	.76	.76	.76
Aug. 20	.18	.32	.40	.47	.52	.67	.75	.92	.96	.98	1.05	1.08
Sept. 21	.53	.67	.81	.83	.84	.86	.89	.90	.92	.93	.94	1.01
Oct. 27	.25	.41	.44	.46	.50	.52	.54	.55	.62	.62	.62	.62
Nov. 15	.40	.50	.55	.59	.67	.83	.90	1.08	1.13	1.19	1.27	1.33
Dec. 29	.20	.30	.45	.50	.70	.77	.93	1.00	1.20	1.32	1.76	2.00
Montgomery Airport												
Feb. 28	.30	.54	.69	.75	.83	.86	.87	.97	.97	.97	.98	.98
Mar. 13	.28	.38	.46	.49	.49	.67	.75	.93	1.10	1.28	1.28	1.28
Mar. 19	.29	.35	.59	.65	.92	1.20	1.38	1.48	1.53	1.60	1.66	1.70
May 13	.43	.57	.59	.61	.61	.61	.61	.61	.61	.61	.61	.61
July 1	.17	.33	.48	.57	.58	.62	.62	.62	.62	.62	.62	.62
July 16	.44	.65	.75	.77	.85	.91	.92	1.19	1.64	1.64	1.64	1.64
Aug. 9	.21	.28	.32	.45	.61	.62	.63	.64	.64	.64	.64	.64
Oct. 6	.22	.39	.53	.67	.81	.90	.91	.91	.93	.93	.94	.98
Nov. 28	.32	.40	.42	.43	.44	.44	.44	.44	.44	.44	.44	.44
ARIZONA												
Phoenix Airport						None						
Prescott												
Aug. 3	.19	.24	.37	.44	.66	.69	.69	.69	.69	.70	.73	.76
Aug. 3	.34	.50	.57	.59	.60	.61	.62	.63	.63	.63	.69	.69
Aug. 5	.27	.37	.45	.50	.50	.50	.50	.50	.50	.50	.50	.52
Sept. 2	.28	.32	.33	.35	.36	.38	.38	.40	.47	.51	.53	.56
Sept. 11	.21	.34	.41	.52	.61	.62	.62	.62	.63	.64	.72	.74
Tucson Airport												
June 24	.38	.62	.83	.98	1.13	1.16	1.16	1.18	1.20	1.24	1.26	1.26
July 23	.39	.55	.57	.58	.59	.64	.65	.65	.65	.65	.65	.70
Sept. 1	.37	.62	.84	1.05	1.19	1.20	1.20	1.20	1.21	1.21	1.21	1.21
Sept. 24	.24	.40	.49	.52	.60	.64	.67	.68	.69	.70	.70	.71
Winslow												
July 24	.20	.30	.30	.32	.52	.52	.52	.53	.54	.54	.54	.54
Yuma Airport						None						
ARKANSAS												
Fort Smith Airport												
Jan. 19	.17	.21	.28	.37	.48	.70	.92	1.04	1.16	1.41	1.72	1.82
Mar. 24	.20	.39	.53	.60	.63	.65	.69	.70	.70	.71	.71	.74
Apr. 11	.20	.40	.43	.49	.59	.63	.65	.65	.65	.65	.65	.65
Apr. 15	.39	.40	.41	.54	.55	.55	.55	.55	.56	.58	.71	.88
Apr. 15	.18	.30	.34	.36	.45	.55	.60	.72	.77	.81	.85	.86
Apr. 30	.38	.42	.54	.58	.65	.67	.68	.70	.70	.71	.72	.72
May 2	.20	.40	.43	.45	.46	.47	.64	.71	.74	.76	.78	.84
May 31	.25	.38	.50	.55	.60	.65	.70	.71	.71	.71	.71	.71
Aug. 1	.28	.53	.71	.75	.94	1.05	1.08	1.08	1.08	1.08	1.09	1.10
Sept. 29	.32	.53	.67	.75	.88	.92	.95	.95	1.05	1.15	1.27	1.31
Oct. 21	.23	.45	.55	.64	.72	.73	.73	.75	.83	.97	1.06	1.17
Oct. 11	.12	.22	.30	.40	.55	.80	.87	.98	1.00	1.04	1.11	1.20
Dec. 27	.45	.83	.91	.94	1.09	1.16	1.19	1.20	1.27	1.30	1.35	1.38
Little Rock Airport												
Feb. 16	.19	.25	.40	.52	.69	1.01	1.24	1.74	1.80	1.97	2.11	2.19
Apr. 7	.23	.43	.55	.64	.92	1.15	1.20	1.25	1.30	1.33	1.33	1.33
May 1	.62	.97	1.05	1.09	1.18	1.18	1.19	1.19	1.19	1.33	1.34	1.34
May 2	.21	.26	.37	.48	.66	.85	1.15	1.38	1.39	1.41	1.42	1.52
July 8	.20	.38	.47	.63	.76	.76	.76	.76	.76	.76	.76	.76
Sept. 30	.16	.31	.38	.41	.45	.48	.50	.52	.53	.60	.68	.78
Texarkana Airport												
Feb. 16	.19	.28	.42	.55	.59	.60	.60	.63	.63	.68	.81	.83
Feb. 19	.20	.27	.38	.43	.48	.52	.78	1.01	1.06	1.06	1.06	1.06
Apr. 11	.21	.37	.54	.71	.87	.91	.93	.95	.95	.95	.95	.95
Apr. 30	.27	.52	.58	.71	.78	.81	.85	.90	.98	1.05	1.09	1.09
May 5	.27	.40	.51	.55	.61	.62	.65	.70	.73	.75	.75	.75
May 29	.23	.43	.53	.57	.61	.64	.68	.72	.74	.75	.75	.76
July 19	.17	.29	.42	.57	.75	.90	.97	.98	.99	.99	.99	1.00
Sept. 30	.30	.51	.54	.56	.60	.63	.68	.76	.80	.84	.86	.86
CALIFORNIA												
Bakersfield Airport						None						
Blue Canyon Airport						None						
Burbank						None						
Eureka												
Jan. 2	.18	.27	.40	.46	.60	.72	.76	.79	.84	.85	.86	.86
Fresno Airport						None						
Los Angeles						None						
Red Bluff Airport						None						
Sacramento						None						
San Diego Airport												
Mar. 16	.20	.34	.46	.51	.55	.58	.60	.63	.63	.64	.70	.72
San Francisco						None						
COLORADO												
Alamosa												
July 4	.24	.44	.58	.61	.65	.68	.68	.70	.71	.72	.72	.72
Denver Airport												
July 14	.48	.68	.84	.89	.92	.94	.95	.97	1.00	1.03	1.07	1.09
July 27	.32	.41	.42	.42	.42	.42	.42	.42	.42	.42	.42	.42
COLORADO (Cont'd.)												
Grand Junction AP						None						
Pueblo Airport												
May 23	0.20	0.28	0.35	0.46	0.63	0.68	0.73	0.78	0.84	0.94	0.95	0.95
CONNECTICUT												
Bridgeport Airport												
May 29	.27	.29	.33	.34	.37	.38	.40	.40	.40	.40	.40	.40
Oct. 15	.45	.90	1.10	1.15	1.45	1.70	1.72	1.72	1.72	1.72	1.72	1.72
Hartford Airport*												
July 24	.22	.42	.53	.55	.56	.57	.58	.59	.60	.60	.71	.74
July 28	.33	.50	.60	.70	.83	.95	1.02	1.06	1.15	1.18	1.20	1.22
Aug. 3	.13	.25	.35	.45	.57	.81	1.04	1.49	1.75	1.95	2.27	2.41
New Haven Airport												
Aug. 31	.11	.20	.31	.35	.54	.77	.98	1.12	1.30	1.43	1.61	1.75
Sept. 11	.40	.55	.60	.65	.68	.79	.84	.90	.96	1.01	1.06	1.16
Sept. 11	.22	.39	.51	.66	.80	1.20	1.46	1.79	2.03	2.19	2.36	2.53
DIST. OF COLUMBIA												
Washington												
May 3	.42	.70	.84	.89	.99	1.34	1.35	1.36	1.37	1.47	1.49	1.50
June 15	.30	.55	.74	1.00	1.22	1.32	1.33	1.34	1.35	1.35	1.35	1.35
June 26	.28	.50	.61	.63	.67	.69	.69	.70	.72	.73	.73	.73
Aug. 19	.20	.35	.39	.41	.44	.45	.46	.46	.46	.46	.46	.46
FLORIDA												
Apalachicola												
Feb. 28	.19	.33	.44	.51	.61	.64	.65	.65	.65	.66	.66	.66
May 12	.23	.34	.37	.38	.41	.46	.53	.59	----	----	----	----
June 12	.57	1.03	1.44	1.75	2.31	2.63	3.71	4.25	4.25	4.25	4.26	4.28
July 5	.23	.39	.50	.54	.76	.95	.99	.99	1.01	1.02	1.03	1.03
July 15	.41	.72	.97	1.20	1.50	1.56	1.58	1.59	1.60	1.60	1.60	1.60
July 20	.25	.40	.51	.55	.86	.96	1.15	1.17	1.18	1.18	1.18	1.18
July 26	.24	.41	.56	.66	.79	.98	1.06	1.15	1.19	1.22	1.25	1.33
Aug. 7	.32	.49	.67	.69	.70	.70	.70	.70	.70	.70	.70	.70
Aug. 13	.31	.46	.58	.78	.81	.87	.89	.89	.89	.90	.91	.91
Sept. 7	.20	.35	.39	.42	.45	.46	.47	.48	.48	.48	.62	.62
Sept. 15	.44	.81	.93	1.15	1.46	1.62	1.68	1.75	1.87	1.95	2.03	2.18
Sept. 17	.27	.39	.46	.57	.87	.98	1.01	1.02	1.02	1.02	1.02	1.02
Dec. 5	.21	.27	.37	.50	.57	.70	.81	.85	.86	.86	.86	.86
Dec. 13	.15	.28	.36	.38	.40	.53	.58	.65	.67	.76	.84	.84
Daytona Beach AP												
Apr. 7	.20	.33	.42	.45	.50	.51	.52	.52	.52	.52	.53	.53
Apr. 20	.22	.40	.55	.65	.90	1.02	1.20	1.50	1.52	1.53	1.55	1.65
Apr. 21	.23	.40	.48	.55	.70	.90	1.12	1.35	1.80	1.92	2.09	2.17
May 29	.27	.43	.60	.78	.99	1.08	1.15	1.17	1.17	1.17	1.17	1.17
May 30	.30	.57	.70	.88	.92	.99	1.01	1.02	1.05	1.05	1.05	1.05
June 3	.22	.35	.37	.39	.44	.45	.45	.46	.46	.53	.53	.53
July 5	.33	.41	.52	.55	.69	.80	.87	.90	.92	.93	.94	.95
July 23	.26	.37	.50	.60	.68	.70	.70	.71	.75	.75	.75	.75
Aug. 1	.25	.37	.45	.55	.73	.77	.77	.77	.77	.77	.77	.77
Aug. 11	.25	.48	.55	.58	.61	.62	.62	.62	.62	.62	.62	.62
Aug. 22	.19	.31	.35	.37	.37	.37	.37	.37	.37	.37	.37	.37
Aug. 24	.26	.38	.39	.39	.39	.49	.54	.72	.72	.92	.93	.93
Oct. 8	.23	.33	.36	.41	.53	.63	.82	.95	1.05	1.10	1.30	1.86
Nov. 10	.27	.38	.46	.48	.48	.50	.54	.54	.56	.61	.62	.62
Fort Myers Airport												
Feb. 24	.30	.38	.41	.42	.43	.49	.54	.57	.59	.59	.59	.60
Feb. 28	.15	.25	.28	.30	.50	.60	.74	.80	.88	.95	1.06	1.13
Apr. 4	.16	.30	.38	.46	.60	.64	.66	.70	.73	.75	.75	.75
Apr. 27	.35	.50	.70	.90	.96	1.12	1.20	1.22	1.28	1.28	1.28	1.28
May 13	.23	.36	.40	.43	.45	.47	.48	.51	.56	.58	.58	.58
May 31	.18	.35	.50	.80	1.12	1.25	1.25	1.25	1.26	1.27	1.27	1.29
June 6	.17	.31	.35	.38	.38	.38	.39	.40	.40	.40	.40	.40
June 15	.37	.65	.86	.98	1.21	1.32	1.35	1.53	1.56	1.57	1.57	1.58
June 16	.18	.35	.38	.39	.42	.43	.49	.82	.95	1.05	1.20	1.26
July 6	.27	.33	.48	.50	.64	.71	.72	.72	.72	.72	.72	.72
July 7	.25	.37	.45	.47	.47	.48	.50	.54	.55	.55	.55	.55
July 8	.29	.38	.47	.51	.55	.56	.57	.59	.59	.60	.60	.60
July 14	.31	.38	.45	.49	.50	.52	.54	.56	.63	.64	.66	.67
July 17	.23	.35	.38	.41	.42	.42	.42	.50	.51	.51	.51	.51
July 19	.20	.27	.38	.47	.49	.51	.52	.52	.52	.52	.52	.52
July 23	.21	.37	.43	.48	.54	.55	.56	.56	.56	.56	.56	.56
July 31	.20	.31	.39	.47	.60	.75	.93	.96	.97	.98	.98	.98
Aug. 8	.31	.40	.44	.51	.59	.61	.61	.62	.63	.65	.67	.68
Aug. 10	.37	.55	.85	1.10	1.42	1.63	2.04	2.12	2.13	2.13	2.13	2.13
Aug. 29	.38	.75	.95	1.14	1.29	1.60	1.83	1.94	1.96	1.99	2.00	2.01
Sept. 1	.20	.38	.47	.60	.80	.85	.85	.92	.96	1.03	1.13	1.26
Sept. 9	.30	.50	.61	.65	.67	.67	.67	.67	.67	.67	.67	.67
Sept. 18	.30	.43	.50	.72	1.00	1.26	1.39	1.45	1.47	1.48	1.51	1.60
Sept. 19	.33	.57	.59	.60	.60	.61	.61	.61	.61	.61	.61	.61
Sept. 20	.35	.42	.45	.50	.76	1.02	1.07	1.13	1.13	1.13	1.13	1.13
Sept. 26	.16	.25	.35	.40	.60	.80	.86	1.02	1.05	1.12	1.20	1.24
Oct. 30	.28	.39	.50	.53	.57	.57	.63	.63	.65	.74	.91	.94
Nov. 23	.29	.40	.50	.53	.56	.57	.58	.60	.60	.60	.60	.60
Dec. 6	.16	.25	.37	.42	.44	.45	.46	.46	.46	.46	.46	.46
Dec. 18	.27	.47	.65	.73	.87	.94	.96	1.04	1.10	1.11	1.13	1.13
Jacksonville												
May 19	.20	.35	.45	.50	.50	.50	.50	.50	.50	.50	.50	.50
June 10	.15	.25	.35	.40	.57	.61	.61	.62	.63	.65	.65	.66
June 23	.30	.53	.57	.59	.62	.64	.64	.64	.64	.65	.66	.68
July 9	.13	.24	.38	.50	.65	.72	.75	.78	.79	.79	.80	.80
July 16	.30	.55	.57	.58	.58	.59	.59	.60	.60	.60	.60	.60
Aug. 19	.24	.32	.41	.43	.44	.44	.45	.45	.45	.45	.45	.46
Aug. 31	.30	.38	.43	.55	.60	.62	.62	.62	.62	.62	.62	.62
Sept. 11	.34	.61	.69	.71	.73	.73	.73	.73	.74	.75	.75	.75
Sept. 15	.41	.62	.80	.84	1.15	1.55	1.91	2.09	2.60	3.00	3.13	3.33
Sept. 18	.21	.30	.37	.39	.40	.41	.45	.45	.45	.45	.45	.45
Oct. 8	.14	.28	.34	.40	.63	.75	1.02	1.18	1.59	1.91	2.26	2.68
Nov. 14	.13	.20	.25	.33	.50	.68	.78	.84	.95	.98	1.01	1.06
Key West												
Mar. 8	.13	.23	.32	.41	.50	.62	.71	.83	.85	.93	1.03	1.19
Apr. 8	.30	.39	.42	.46	.48	.48	.48	.48	.49	.49	.49	.49
Apr. 23	.34	.67	1.02	1.34	1.70	1.94	2.07	2.17	2.18	2.24	2.28	2.31

* Recorded at Brainard Field. No excessive precipitation at Bradley Field after this period.

Table 8—Continued

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
FLORIDA (Cont'd.)												
Key West (Cont'd.)												
Apr. 26	0.25	0.43	0.52	0.59	0.56	0.70	0.74	0.86	0.87	0.89	0.93	0.98
May 27	.23	.42	.48	.49	.51	.52	.52	.52	.52	.52	.52	.52
May 31	.16	.30	.42	.49	.58	.62	.64	.66	.68	.70	.73	.74
June 5	.21	.26	.35	.49	.65	.65	.65	.65	.65	.65	.65	.65
June 15	.20	.34	.46	.54	.58	.66	.97	1.07	1.08	1.32	1.45	1.51
June 15	.25	.39	.49	.75	.82	.85	.92	1.01	1.09	1.16	1.23	1.36
June 18	.14	.24	.35	.40	.46	.48	.50	.52	.52	.52	.52	.52
Aug. 24	.35	.58	.69	.82	1.04	1.17	1.19	1.19	1.19	1.19	1.19	1.19
Aug. 28	.39	.68	.75	.83	1.04	1.30	1.33	1.34	1.34	1.34	1.34	1.34
Sept. 1	.33	.39	.44	.45	.50	.53	.54	.55	.55	.55	.58	.58
Sept. 3	.25	.43	.55	.63	.65	.65	.65	.65	.66	.66	.66	.69
Nov. 13	.49	.80	1.29	1.62	2.16	3.32	4.16	5.40	6.85	7.87	8.77	9.59
Nov. 13-14*	----	Excessive occurred in 10.11 fall							----	----	----	----
Dec. 6	.33	.44	.49	.49	.50	.50	.50	.50	.50	.50	.50	.50
Miami												
Feb. 28	.19	.34	.44	.51	.60	.73	.82	.88	.95	1.10	1.24	1.31
Mar. 20	.32	.51	.56	.58	.60	.63	.66	.67	.68	.68	.69	.70
Apr. 3	.32	.55	.76	.86	.90	.95	.95	.95	.95	.95	.95	.95
Apr. 6	.39	.64	.72	.97	1.39	1.81	1.95	2.02	2.05	2.05	2.05	2.05
Apr. 7	.33	.60	.85	.99	1.04	1.37	1.45	1.46	1.46	1.46	1.46	1.46
May 12	.27	.51	.58	.76	.90	1.20	1.30	1.35	1.40	1.43	1.44	1.48
May 13	.29	.51	.65	.77	1.15	1.28	1.28	1.28	1.28	1.28	1.35	1.38
May 27	.18	.31	.38	.45	.58	.72	.74	.79	.79	.79	.79	.79
May 27	.31	.54	.71	.80	.94	1.11	1.23	1.35	1.48	1.61	1.80	1.92
May 31	.19	.37	.48	.56	.58	.58	.58	.58	.58	.59	.60	.61
June 4	.18	.27	.36	.41	.44	.45	.46	.46	.46	.46	.46	.46
June 4	.30	.53	.57	.61	.83	1.18	1.26	1.26	1.26	1.26	1.26	1.26
June 18	.22	.41	.60	.68	.77	1.15	1.24	1.27	1.34	1.43	1.52	1.70
July 11	.37	.54	.63	.69	.74	.74	.74	.74	.74	.74	.74	.74
July 15	.40	.66	.94	1.01	1.23	1.38	1.45	1.47	1.51	1.53	1.57	1.57
July 25	.19	.38	.50	.56	.62	.68	.69	.75	.75	.75	.75	.75
Sept. 2	.22	.31	.41	.48	.48	.48	.49	.49	.49	.49	.49	.49
Sept. 17	.17	.30	.43	.44	.44	.44	.44	.44	.44	.44	.44	.44
Oct. 2	.23	.37	.48	.56	.59	.61	.70	.72	.72	.75	.76	.85
Nov. 12	.33	.56	.64	.72	.81	.86	.91	1.06	1.17	1.25	1.85	1.97
Orlando Airport												
Apr. 24	.19	.28	.39	.47	.56	.63	.90	.95	.98	1.00	1.00	1.00
Apr. 30	.22	.38	.58	.62	.73	.76	.77	.79	.81	.81	.81	.81
May 4	.38	.71	.88	.95	.98	.98	.98	1.03	1.06	1.11	1.37	1.38
June 13	.35	.60	.80	.95	1.30	1.41	1.44	1.44	1.44	1.44	1.44	1.44
July 1	.42	.57	.89	1.03	1.12	1.14	1.14	1.14	1.14	1.15	1.15	1.15
July 5	.28	.31	.32	.32	.32	.44	.61	.61	.61	.61	.61	.61
July 7	.27	.47	.56	.76	1.06	1.25	1.29	1.30	1.30	1.30	1.30	1.30
July 11	.60	.89	1.02	1.12	1.27	1.40	1.45	1.69	1.72	1.72	1.78	1.81
July 24	.41	.74	1.00	1.19	1.60	1.95	2.29	2.41	2.43	2.43	2.43	2.48
July 26	.44	.78	1.23	1.53	2.10	2.39	2.48	2.57	2.57	2.58	2.59	2.60
July 30	.16	.31	.37	.38	.44	.49	.50	.53	.53	.53	.53	.53
Aug. 8	.35	.65	.87	.98	1.16	1.20	1.23	1.25	1.52	1.56	1.59	1.59
Aug. 26	.18	.27	.39	.45	.58	.60	.60	.60	.60	.60	.60	.60
Aug. 28	.25	.40	.45	.50	.52	.52	.52	.53	.53	.62	.68	.72
Sept. 27	.28	.45	.55	.70	.77	.81	.83	.84	.84	.84	.84	.84
Oct. 8	.25	.38	.40	.42	.45	.50	.51	.52	.61	.89	.89	.89
Oct. 8	.29	.51	.60	.64	.67	.72	.79	.91	.99	1.03	1.38	1.48
Oct. 14	.13	.25	.36	.41	.47	.48	.48	.48	.48	.57	.63	.63
Nov. 17	.45	.50	.53	.53	.53	.53	.53	.53	.53	.53	.53	.53
Dec. 18	.23	.32	.50	.56	.64	.66	.70	.72	.75	.77	.81	.83
Pensacola												
Feb. 20	.33	.38	.40	.46	.48	.56	.71	.74	.77	.77	.79	.93
Apr. 12	.22	.43	.45	.45	.45	.45	.45	.45	.45	.45	.45	.45
May 27	.24	.33	.37	.38	.48	.49	.53	.64	.66	.84	.87	.88
May 28	.24	.35	.38	.40	.44	.44	.44	.44	.44	.62	.69	.77
July 8	.22	.36	.44	.50	.55	.62	.63	.67	.74	.77	.85	.87
July 15	.15	.26	.35	.39	.53	.67	.68	.68	.68	.68	.68	.68
July 16	.42	.69	.98	1.15	1.25	1.27	1.27	1.27	1.28	1.28	1.30	1.31
July 24	.35	.57	.73	.96	1.35	1.51	1.52	1.53	1.53	1.60	1.75	1.76
July 26	.31	.48	.54	.55	.76	.94	.95	1.00	1.00	1.12	1.55	1.55
Aug. 4	.21	.29	.36	.43	.50	.50	.50	.50	.50	.50	.50	.50
Dec. 12	.26	.38	.40	.41	.54	.60	.63	.64	.69	.75	.77	.82
West Palm Beach												
Jan. 22	.30	.50	.58	.70	.81	.81	.81	.81	.81	.81	.81	.81
Mar. 21	.17	.32	.36	.41	.43	.44	.46	.48	.48	.48	.48	.48
Apr. 7	.38	.60	.79	1.00	1.45	1.79	2.06	2.23	2.36	2.46	2.60	2.66
Apr. 8	.20	.35	.41	.46	.51	.58	.58	.58	.58	.58	.58	.64
Apr. 22	.32	.48	.74	.98	1.03	1.12	1.26	1.31	1.40	1.41	1.41	1.41
May 15	.33	.41	.47	.48	.49	.51	.52	.52	.52	.52	.52	.52
May 16	.27	.32	.40	.46	.49	.52	.54	.54	.54	.54	.54	.54
May 17	.29	.55	.71	.75	.78	.85	.99	1.00	1.00	1.07	1.08	1.08
May 27	.39	.75	.97	1.12	1.30	1.47	1.51	1.52	1.52	1.52	1.52	1.52
June 4	.25	.40	.60	.81	.96	1.27	1.61	1.63	1.63	1.64	1.97	1.97
June 14	.17	.29	.40	.55	.70	.80	.83	.89	.90	.91	1.01	1.02
June 16	.23	.32	.36	.40	.51	.60	.64	.67	.69	.70	.77	.87
June 18	.19	.30	.36	.50	.61	.69	.72	.79	.83	.85	.90	.92
June 18	.20	.35	.50	.57	.60	.72	1.09	1.10	1.10	1.18	1.26	1.27
June 19	.21	.42	.53	.60	.65	.75	1.10	1.21	1.27	1.46	1.49	1.50
July 11	.21	.33	.36	.38	.43	.48	.49	.52	.53	.54	.54	.54
July 14	.21	.36	.37	.37	.37	.38	.39	.46	.48	.48	.48	.53
July 15	.27	.45	.69	.78	.78	.79	.79	.97	1.34	1.48	1.75	1.76
July 24	.21	.34	.45	.56	.61	.82	.88	.89	.89	.89	.89	.89
July 25	.40	.64	.83	.96	1.05	1.09	1.12	1.16	1.22	1.27	1.30	1.31
July 28	.37	.57	.66	.80	1.09	1.20	1.22	1.22	1.23	1.24	1.25	1.31
July 31	.40	.72	.82	.83	.83	.83	.84	.84	.84	.84	.84	.87
Aug. 15	.25	.31	.40	.45	.45	.45	.45	.45	.45	.45	.45	.45
Aug. 26	.25	.35	.46	.49	.50	.50	.51	.51	.54	.56	.56	.56
Sept. 1	.12	.21	.30	.33	.47	.65	.82	.85	.87	.92	.95	.99
Sept. 12	.25	.50	.70	.85	1.17	1.25	1.36	1.44	1.46	1.46	1.46	1.51
Sept. 13	.20	.31	.41	.53	.68	.84	.97	1.21	1.21	1.21	1.23	1.23
Sept. 13	.19	.31	.41	.45	.51	.56	.59	.60	.61	.63	.67	.69
Oct. 22	.25	.37	.45	.52	.55	.60	.61	.61	.61	.62	.63	.64
Nov. 14	.28	.43	.52	.64	.82	.90	.91	1.01	1.05	1.05	1.05	1.05
GEORGIA												
Atlanta Airport												
Jan. 16	.55	.60	.66	.70	.75	.78	.87	.91	.92	1.00	1.01	1.02
Jan. 21	.20	.33	.40	.42	.48	.66	.77	.98	1.09	1.11	1.12	1.16
Jan. 21	.29	.33	.37	.39	.41	.42	.43	.45	.45	.45	.45	.46
Feb. 16	.25	.37	.44	.47	.53	.57	.59	.60	.60	.60	.60	.60
Feb. 20	.20	.35	.43	.50	.57	.66	.70	.73	.75	.81	.81	.82
Mar. 13	.28	.37	.40	.45	.50	.56	.62	.68	.76	.80	.98	1.06
May 3	.38	.43	.46	.48	.50	.52	.52	.54	.54	.54	.54	.54
June 15	.18	.33	.41	.48	.75	.91	.93	.93	.94	.96	1.01	1.05
GEORGIA (Cont'd.)												
Atlanta AP (Cont'd.)												
July 2	0.50	1.00	1.37	1.41	1.56	1.66	1.75	1.75	1.75	1.75	1.75	1.75
July 14	.60	.80	.93	1.05	1.14	1.26	1.50	2.12	2.22	2.25	2.26	2.26
Aug. 20	.18	.25	.34	.42	.44	.44	.44	.45	.45	.45	.45	.45
Augusta Airport												
Feb. 28	.23	.36	.38	.39	.40	.41	.41	.41	.41	.41	.41	.41
Mar. 14	.28	.47	.60	.71	.88	1.03	1.07	1.09	1.10	1.10	1.10	1.10
Apr. 29	.17	.31	.48	.49	.50	.52	.52	.52	.52	.52	.52	.52
June 1-2	.40	.64	.71	.76	.91	.94	.95	.95	.95	1.18	1.32	1.32
June 23	.33	.59	.70	.72	.72	.80	.80	.80	.80	.80	.80	.80
July 8	.34	.48	.76	.98	1.32	1.90	2.50	2.72	2.74	2.75	2.75	2.76
July 26	.40	.75	.92	1.20	1.38	1.40	1.42	1.42	1.42	1.42	1.42	1.42
Aug. 9	.30	.55	.70	.80	.88	.88	.89	.89	.90	.90	.90	.90
Aug. 20	.35	.46	.51	.54	.54	.54	.70	.73	.74	.75	.75	.75
Aug. 28	.19	.37	.48	.58	.69	.72	.73	.74	.74	.76	.81	.81
Oct. 6	.27	.44	.58	.74	.87	.88	.89	.90	.90	.90	.90	.90
Columbus Airport												
Mar. 13	.27	.35	.50	.60	.93	1.18	1.45	1.60	1.68	1.69	1.70	1.70
Apr. 5	.35	.65	.70	.79	.80	.80	.80	.80	.80	.80	.80	.80
Apr. 29	.30	.43	.45	.45	.46	.47	.47	.47	.47	.47	.47	.47
May 3	.25	.33	.35	.40	.53	.63	.73	.74	.76	.76	.76	1.10
June 14	.25	.27	.28	.29	.30	.30	.30	.30	.30	.30	.30	.30
June 17	.25	.45	.69	.70	.72	.74	.77	.84	.85	.87	.88	.88
July 5	.35	.55	.68	.73	1.04	1.20	1.35	1.52	1.52	1.52	1.52	1.52
July 16	.26	.35	.50	.55	.60	.61	.62	.63	.63	.63	.63	.63
July 17	.28	.47	.61	.68	.79	.98	1.03	1.06	1.07	1.08	1.08	1.09
July 23	.30	.50	.66	.72	.77	.82	.82	.82	.82	.82	.82	.82
Aug. 7	.26	.40	.60	.65	.81	.85	.85	.85	.85	.85	.85	.85
Oct. 28	.35	.40	.45	.46	.46	.47	.48	.49	.51	.52	.54	.70
Nov. 16	.25	.35	.49	.60	.75	.86	.96	1.06	1.12	1.18	1.22	1.22
Dec. 5	.48	.61	.62	.63	.68	.76	.81	.82	.82	.82	.82	.82
Macon Airport												
Mar. 13	.42	.58	.74	.82	.86	1.00	1.14	1.15	1.15	1.15	1.15	1.15
Apr. 29	.33	.62	.82	1.00	1.30	1.60	1.62	1.63	1.63	1.63	1.63	1.63
May 3	.25	.48	.66	.78	.84	.89	.95	1.00	1.01	1.01	1.04	1.07
July 4	.30	.51	.71	.88	.95	1.05	1.06	1.07	1.07	1.07	1.07	1.07
July 14	.14	.23	.39	.50	.70	.76	.82	.88	.88	.89	.91	.92
Aug. 28	.25	.44	.57	.65	.72	.94	.98	1.08	1.16	1.16	1.19	1.19
Sept. 15	.19	.34	.46	.57	.76	.84	.89	.99	1.08	1.14	1.29	1.39
Oct. 29	.13	.21	.30	.38	.51	.56	.57	.57	.60	.60	.50	.71
Rome Airport												
Jan. 21	.17	.30	.33	.35	.53	.77	.87	1.03	1.17	1.19	1.29	1.44
Jan. 16	.15	.26	.30	.35	.47	.68	.76	.90	1.19	1.40	1.62	1.90
Mar. 13	.27	.29	.32	.32	.33	.33	.36	.38	.40	.41	.41	.41
Mar. 31	.34	.48	.63	.65	.65	.65	.65	.65	.66	.66	.67	.67
Apr. 28	.22	.42	.50	.56	.60	.64	.65	.65	.65	.65	.65	.65
May 2	.15	.30	.36	.37	.38	.39	.39	.39	.39	.39	.39	.39
June 1	.22	.30	.37	.37	.37	.37	.42	.42	.42	.42	.42	.42
June 3	.33	.50	.76	.77	.86	.93	.96	1.02	1.21	1.32	1.49	1.60
June 15	.26	.29	.29	.29	.29	.30	.30	.30	.30	.30	.30	.30
June 17	.35	.65	.95	1.28	1.48	1.51	1.75	1.77	1.79	1.86	1.94	1.96
July 9	.25	.30	.35	.38	.39	.39	.39	.39	.39	.39	.39	.39
Aug. 18	.20	.30	.42	.46	.52	.65	.65	.65	.65	.65	.65	.65
Dec. 29	.26	.31	.40	.45	.48	.60	.70	.81	.90	1.05	1.25	1.30
Savannah Airport												
Mar. 27	.38	.54	.55	.56	.59	.61	.64	.69	.70	.70	.70	.73
Apr. 14	.48	.74	.81	.82	.83	.87	.87	.87	.87	.87	.87	.87
May 3	.37	.47	.48	.48	.48	.48	.48	.48	.48	.49	.50	.50
May 13	.21	.42	.63	.84	1.16	1.49	1.80	1.93	1.93	1.93	1.93	1.98
May 13	.19	.30	.36	.38	.42	.44	.46	.48	.51	.56	.56	.56
July 4	.46	.67	.85	.99	1.08	1.10	1.11	1.11	1.11	1.12	1.12	1.15
July 17	.39	.58	.71	.84	1.05	1.28	1.34	1.38	1.41	1.47	1.50	1.53
Sept. 15	.32	.55	.66	.75	.88	.99	1.05	1.08	1.14	1.16	1.30	1.74
Sept. 15	.27	.33	.39	.47	.67	.85	.98	1.03	1.21	1.46	1.85	2.09
Oct. 3	.22	.32	.41	.44	.49	.52	.53	.53	.53	.53	.53	.53
Oct. 3	.20	.32	.42	.45	.45	.45	.45	.45	.45	.45	.45	.45
Oct. 14	.35	.51	.55	.57	.71	1.04	1.34	1.59	1.75	1.95	2.12	2.13
IDAHO												
Boise Airport						None						
Pocatello Airport						None						
ILLINOIS												
Cairo												
Feb. 16	.20	.28	.36	.39	.44	.51	.58	.67	.74	.84	1.01	1.19
Mar. 25	.16	.23	.27	.37	.50	.54	.56	.60	.63	.66	.68	.70
Apr. 27	.15	.27	.32	.47	.52	.61	.64	.73	.74	.74	.74	.74
May 2	.22	.36	.45	.53	.59	.64	.70	.82	.84	.84	.84	.85
May 2	.21	.33	.42	.48	.52	.55	.58	.62	.66	.66	.67	.68
May 28	.19	.32	.40	.41	.43	.44	.45	.49	.53	.56	.59	.61
June 2	.43	.69	.93	1.03	1.42	1.47	1.52	1.86	2.12	2.15	2.16	2.17
June 9	.26	.39	.43	.44	.49	.50	.52	.53	.61	.68	.70	.70
July 21	.19	.31	.33	.33	.33	.34	.34	.34	.34	.34	.34	.36
July 22	.44	.73	1.04	1.27	1.68	1.87	2.30	2.33	2.38	2.41	2.41	2.41
Aug. 1	.24	.43	.57	.72	.83	.88	.90	.93	.94	.95	.95	.95
Aug. 5	.27	.36	.42	.46	.51	.54	.56	.56	.56	.57	.57	.57
Aug. 19	.45	.73	.95	1.08	1.26	1.33	1.34	1.36	1.40	1.45	1.48	1.49
Sept. 20	.21	.30	.36	.45	.46	.46	.47	.49	.53	.53	.53	.55
Sept. 20	.53	.81	.87	1.00	1.20	1.52	1.60	1.64	1.68	1.69	1.71	1.71
Oct. 25	.24	.35	.43	.48	.58	.79	.88	.95	1.03	1.07	1.12	1.17
Chicago Airport												
Mar. 25	.40	.49	.53	.54	.58	.63	.70	.81	.87	.92	.98	1.09
Apr. 6	.15	.28	.35	.39	.42	.44	.50	.60	.67	.69	.71	.75
June 1	.36	.45	.52	.56	.66	.67	.69	.75	.81	.86	.90	.95
June 19	.38	.58	.67	.72	.82	.82	.82	.82	.82	.82	.82	.82
June 20	.18	.32	.34	.35	.36	.36	.36	.36	.36	.36	.36	.36
June 22	.18	.26	.36	.38	.39	.40	.41	.41	.41	.42	.43	.43
July 3	.54	.75	.87	.91	.93	.97	1.02	1.04	1.04	1.05	1.05	1.05
Aug. 16	.61	1.02	1.04	1.05	1.06	1.07	1.08	1.11	1.13	1.15	1.16	1.16
Aug. 18	.35	.65	.78	1.00	1.19	1.28	1.37	1.48	1.59	1.63	1.70	1.75
Aug. 24	.22	.35	.44	.48	.54	.56	.57	.57	.57	.57	.57	.57
Aug. 25	.36	.53	.63	.65	.66	.67	.68	.69	.69	.73	.85	.85
Oct. 3	.27	.42	.57	.73	1.08	1.39	1.55	1.69	1.96	2.54	2.74	3.19
Oct. 10	.34	.56	.69	.78	1.10	1.33	1.34	1.35	1.39	1.55	1.58	1.63
Moline Airport												
May 28	.23	.35	.53	.61	.69	.75	.76	.78	.80	.80	.80	.80

* Not recorded due to instrument failure.

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
ILLINOIS (Cont'd.)												
Moline AP (Cont'd.)												
May 31	0.30	0.55	0.57	0.58	0.61	0.63	0.68	0.72	0.78	0.85	0.88	0.90
May 31	.19	.37	.43	.51	.58	.61	.66	.73	.83	.92	.99	1.03
June 16	.25	.43	.49	.52	.57	.58	.62	.64	.67	.67	.82	.91
June 20	.30	.43	.61	.74	.99	1.37	1.57	1.58	1.62	1.67	1.69	1.70
June 21	.25	.33	.36	.40	.40	.40	.40	.41	.44	.45	.45	.45
July 20	.37	.65	85	1.00	1.01	1.01	1.02	1.04	1.05	1.06	1.09	1.10
Aug. 2	.35	.46	.64	.64	.66	.72	.75	.75	.75	.75	.75	.79
Aug. 9	.34	.41	.41	.41	.41	.42	.42	.42	.42	.42	.42	.42
Oct. 10	.26	.46	.55	.64	1.07	1.11	1.18	1.33	1.48	1.96	2.15	2.30
Peoria Airport												
Feb. 15	.27	.36	.48	.52	.57	.67	.83	.87	1.10	1.13	1.14	1.58
Mar. 25	.19	.32	.39	.46	.51	.80	.89	.95	1.03	1.10	1.18	1.18
Apr. 6	.15	.25	.34	.44	.51	.74	.91	1.19	1.43	1.47	1.53	1.65
May 28	.24	.38	.41	.41	.41	.43	.44	.45	.45	.45	.45	.45
May 28	.20	.34	.54	.58	.59	.59	.59	.59	.59	.59	.62	.63
May 31	.16	.28	.36	.42	.47	.52	.57	.60	.61	.63	.63	.63
June 2	.17	.30	.36	.40	.45	.48	52	.64	.87	.94	1.04	1.13
June 7	.21	.38	.42	.62	.79	.84	1.01	1.02	1.02	1.02	1.02	1.02
June 15	.20	.30	.46	.60	.84	1.04	1.06	1.08	1.09	1.09	1.09	1.09
June 29	.40	.75	1.10	1.20	1.46	1.65	1.67	1.69	1.72	1.74	1.76	1.77
July 3	.25	34	.35	.36	.37	.37	.38	.39	.43	.44	.44	.45
July 20	.28	.31	.35	.40	.44	.45	.46	.47	.48	50	.50	.50
Aug. 4	.30	.40	.70	.80	.90	.99	1.00	1.12	1.34	1.37	1.67	1.68
Aug. 9	.30	.53	.72	.74	.74	.74	.74	.75	.75	.75	.75	.75
Aug. 25	.53	.90	1.20	1.36	1.76	2.03	2.25	2.30	2.30	2.30	2.30	2.30
Aug 26	.32	.42	.68	.70	.76	.81	.84	.89	.91	.93	.95	.96
Oct. 10	.26	.42	.46	.52	.60	.67	.69	.70	.70	.70	.82	.98
Springfield AP												
May 31-June 1	.24	.40	.52	.56	.61	.62	.63	.64	.64	.64	.64	.64
June 8	.41	.61	.70	1.03	1.21	1.24	1.25	1.27	1.28	1.28	1.28	1.28
June 13	.23	.35	.58	.63	.75	.82	.90	.90	.90	.90	.90	.90
July 3	.23	.34	.37	.38	.38	.38	.38	.38	.40	.40	.40	.40
Aug. 19	.34	.42	.45	.47	.66	.99	1.13	1.16	1.20	1.25	1.26	1.26
Oct. 10	.38	.41	.43	.44	.46	.49	.50	.52	.55	.69	.75	.82
INDIANA												
Evansville Airport												
Jan. 20	.11	.21	.31	.33	.52	.64	.89	1.06	1.16	1.18	1.20	1.24
Apr. 22	.20	.35	.37	.37	.37	.37	.37	.37	.37	.37	.37	.37
June 2	.19	.30	.38	.48	.64	.69	.71	.75	.79	.83	.87	.88
July 1	.34	.46	.56	.61	.70	.74	.84	.90	.90	.90	.90	.90
Aug. 2	.22	.37	.52	.54	.58	.62	.62	.70	.86	.94	.99	1.05
Aug. 17	.12	.24	.33	.42	.48	.51	.69	.73	.75	.83	.85	.86
Sept. 19	.30	.46	.75	.92	.94	.94	.94	.94	.94	.94	.94	.94
Sept. 20	.13	.23	.29	.41	.52	.68	.88	.99	1.09	1.15	1.22	1.41
Fort Wayne Airport												
May 28	.28	.49	.52	.53	.54	.55	.55	.57	.58	.58	.58	.58
May 31	.25	.35	.44	.45	.60	.71	.76	.79	.81	.86	.93	1.00
June 10	.22	.33	.41	.44	.47	.48	.49	.51	.54	.54	.54	.54
July 6	.19	.31	.32	.35	.41	.46	.47	.52	.57	.62	.69	.83
Aug. 4	.25	.45	.55	.67	.72	.73	.81	.90	1.25	1.29	1.30	1.30
Aug. 5	.27	.32	.32	.33	.34	.34	.34	.34	.34	.34	.34	.34
Aug. 18	.46	.56	.64	.75	.79	.79	.79	.79	.79	.79	.79	.79
Aug. 18	.20	.30	.40	.54	.63	.63	.63	.63	.63	.63	.63	.63
Sept. 30	.49	.68	.78	.80	.83	.86	.87	.88	.88	.88	.88	.88
Oct. 3	.22	.28	.35	.48	.63	.74	.99	1.11	1.25	1.37	1.49	1.61
Oct. 5	.25	.45	.57	.62	.75	.88	1.10	1.26	1.41	1.58	1.68	1.75
Oct. 9	.24	.45	.53	.60	.64	.66	.67	.70	.70	.75	.84	.89
Indianapolis AP												
May 29	.30	.55	.58	.60	.60	.60	.61	.62	.63	.65	.65	.66
July 7	.40	.50	.55	.55	.56	.56	.60	.61	.61	.68	.71	.71
Oct. 11	.34	.38	.39	.40	.41	.43	.45	.46	.46	.46	.48	.49
South Bend Airport												
May 31	.16	.29	.41	.46	.53	.56	.58	.59	.60	.61	.62	.62
July 2	.37	.52	.65	.72	.92	.97	1.00	1.05	1.12	1.18	1.23	1.25
July 3	.57	.69	.70	.71	.72	.74	.80	.84	.87	.88	.88	.88
July 6	.28	.40	.52	.55	.59	.60	.62	.67	.73	.79	.89	1.01
July 20	.22	.34	.41	.42	.42	.42	.42	.42	.42	.44	.44	.44
Aug. 18	.55	.65	.73	.79	.87	.95	1.00	1.04	1.16	1.20	1.20	1.20
Aug. 25	.30	.43	.48	.53	.65	.78	.78	.78	.78	.92	.93	.93
Aug. 25	.27	.48	.50	.53	.54	.54	.54	.56	.57	.58	.58	.62
Oct. 3	.25	.39	.47	.60	.78	.92	1.00	1.06	1.12	1.17	1.24	1.28
Oct. 10	.27	.35	.50	.54	.55	.65	.70	.75	.88	.95	1.03	1.09
Oct. 14	.20	.30	.34	.34	.37	.37	.38	.50	.53	.54	.55	.55
Terre Haute AP*												
Jan. 20	.25	.45	.54	.55	.59	.62	.63	.63	.67	.67	.67	.67
May 2	.28	.50	.72	.78	.81	.81	.81	.82	.82	.93	1.06	1.15
June 1	.18	.32	.35	.36	.37	.38	.38	.38	.38	.38	.41	.43
June 13	.28	.48	.56	.64	.75	.81	.81	.81	.81	.81	.81	.81
IOWA												
Burlington Airport												
Apr. 6	.35	.39	.47	.55	.68	.88	1.05	1.12	1.15	1.19	1.29	1.32
Apr. 15	.16	.31	.34	.42	.46	.51	.56	.57	.59	.59	.59	.59
Apr. 30	.29	.35	.38	.39	.42	.45	.45	.45	.45	.45	.45	.45
May 27	.52	.64	.71	.74	.78	1.00	1.13	1.14	1.14	1.14	1.14	1.14
May 31	.15	.29	.42	.45	.53	.59	.65	.70	.76	.81	.90	1.00
June 29	.27	.39	.41	.45	.46	.47	.48	.49	.49	.49	.49	.49
July 28	.19	.32	.41	.48	.59	.62	.71	.78	.78	.79	.79	.79
Aug. 4	.24	.31	.33	.38	.46	.50	.79	.83	.84	1.08	1.13	1.32
Aug. 26	.40	.51	.55	.58	.86	1.05	1.24	1.31	1.38	1.46	1.54	1.63
Sept. 20	.18	.32	.42	.54	.59	.59	.59	.59	.59	.59	.59	.59
Oct. 10	.25	.32	.38	.43	.50	.63	.69	.74	.80	.85	1.06	1.44
Oct. 11	.31	.44	.44	.44	.44	.44	.44	.44	.44	.44	.44	.44
Davenport												
Apr. 20	.15	.30	.35	.40	.55	.64	.65	.66	.67	.68	.69	.70
Apr. 30	.28	.33	.37	.38	.40	.42	.43	.43	.43	.43	.43	.43
May 28	.25	.40	.47	.52	.58	.61	.61	.62	.62	.62	.62	.62
May 31	.19	.29	.37	.39	.45	.46	.51	.52	.58	.67	.73	.76
May 31	.30	.37	.39	.42	.63	.67	.69	.73	.82	.92	1.05	1.10
June 20	.30	.50	.68	.95	1.15	1.50	1.95	2.08	2.09	2.10	2.11	2.11
Aug. 2	.34	.50	.55	.62	.70	.98	1.08	1.08	1.08	1.08	1.08	1.08
Aug. 3-4	.25	.40	.44	.54	.77	.82	.83	.85	.90	1.19	1.22	1.27
Aug. 4	.34	.54	.61	.63	1.00	1.22	1.23	1.24	1.31	1.34	1.37	1.37
Oct. 9-10	.17	.32	.45	.50	.72	.80	.92	1.05	1.10	1.36	1.77	1.87
Oct. 10	.47	.66	.72	.77	.89	.92	.94	.95	1.04	1.07	1.09	1.15

* Recorder removed after July 31, 1954

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
IOWA (Cont'd.)												
Des Moines AP												
May 23	0.20	0.38	0.54	0.61	0.69	0.70	0.71	0.73	0.75	0.75	0.75	0.75
May 28	.20	.32	.36	.40	.42	.42	.45	.50	.51	.51	.52	.52
May 31	.15	.26	.40	.47	.67	1.00	1.22	1.32	1.58	1.61	1.77	1.88
June 12	.30	.55	.75	.90	1.10	1.30	1.35	1.37	1.39	1.40	1.40	1.40
June 15	.32	.38	.40	.47	.70	.75	78	.84	.97	.98	1.00	1.00
June 15	.42	.52	.59	.64	.69	.70	.72	.80	.92	.95	.97	.97
June 21	.35	.55	.56	.60	.63	.68	.68	.68	.68	.68	.68	.68
Aug. 21	.30	.50	.65	.80	1.13	1.58	1.75	1.94	2.01	2.07	2.09	2.19
Aug. 23	.28	.55	.67	.71	.75	.79	.80	.81	.82	.83	.85	.88
Aug. 26	.15	.25	.35	.40	.60	.82	1.09	1.40	1.56	1.69	2.13	2.31
Dubuque AP												
Apr. 5	.33	.58	.63	.68	.74	.83	.92	1.03	1.22	1.34	1.50	1.58
Apr. 26	.26	.31	.33	.34	.34	.34	.38	.30	.38	.38	.38	.38
Apr. 26	.14	.23	.33	.43	.62	.75	.84	.93	.95	.97	.97	.97
June 15	.45	.85	1.20	1.40	1.70	2.40	2.60	2.89	2.89	2.89	2.90	2.90
Aug. 18	.25	.35	.37	.38	.40	.42	.46	.60	.67	.74	.76	.84
Oct. 2	.21	.35	.43	.50	.62	.67	.70	.72	.74	.75	.80	.80
Oct. 10	.21	.29	.36	.48	.56	.69	.81	.86	1.08	1.12	1.13	1.35
Sioux City												
Apr. 5-6	.25	.25	.25	.25	.25	.25	.25	.35	.35	.35	.35	.35
May 27	.21	.38	.41	.43	.47	.51	.55	.58	.59	.59	.59	.59
June 20	.43	.76	1.03	1.27	1.72	2.02	2.19	2.40	2.73	2.95	3.07	3.33
Sept. 9	.12	.21	.26	.33	.50	.54	.60	.71	.74	.74	.74	.74
Oct. 2	.23	.37	.48	.58	.64	.74	.90	.99	1.09	1.27	1.39	1.40
KANSAS												
Concordia												
May 26	.31	.42	.45	.46	.48	.50	.53	.53	.53	.53	.53	.53
June 14	.13	.26	.33	.38	.49	.68	.69	.70	.70	.70	.70	.70
Aug. 1	.37	.62	.68	.76	.99	1.00	1.00	1.01	1.01	1.01	1.01	1.01
Aug. 7	.30	.44	.53	.63	.75	.84	.87	.93	.93	.93	.93	.93
Aug. 26	.17	.30	.34	.38	.40	.42	.42	.42	.42	.42	.42	.42
Aug. 30	.21	.41	.51	.56	.59	.60	.62	.62	.62	.62	.62	.62
Sept. 8	.20	.37	.47	.57	.59	.60	.62	.64	.73	.77	.90	1.06
Dodge City AP												
July 27	.15	.30	.45	.57	.72	.87	.90	.90	.91	.93	.95	.99
Aug 20	.30	.37	.43	.45	.45	.47	.48	.50	.50	.50	.55	.59
Sept. 8	.33	.43	.47	.47	.47	.47	.52	.69	.83	.83	.83	.83
Oct. 25	.18	.31	.37	.55	.57	.57	.57	.57	.62	.62	.62	.63
Goodland												
May 17	.18	.32	.43	.53	.62	.66	.69	.70	.71	.72	.73	.73
May 26	.23	40	.50	.53	.53	.53	.53	.53	.53	.53	.53	.53
June 12	.30	.48	.54	.71	.82	.83	.83	.83	.83	.83	.83	.83
Aug. 29	.30	.45	.63	.71	.77	.82	.82	.82	.82	.82	.82	.82
Sept. 14	.25	.45	.53	.58	.61	.73	.74	.75	.75	.75	.75	.75
Topeka												
May 23	.21	.33	.37	.42	.44	.47	.51	.55	.59	.61	.63	.64
May 31	.42	.48	.55	.56	.56	.56	.56	.57	.57	.57	.57	.57
June 14	.27	.30	.36	.36	.36	.41	.47	.52	.52	.53	.56	.56
July 1-2	.23	.29	.42	.54	.69	1.02	1.12	1.40	1.52	1.89	1.91	1.91
July 10	.16	.20	.25	.36	.51	.63	.71	.77	.86	1.13	1.34	1.37
Aug. 1**	----	----	----	----	----	----	.93	.98	1.02	1.02	1.02	1.02
Aug. 21**	----	----	----	----	----	----	----	----	----	----	----	----
Oct. 11	.35	.58	.74	.75	.76	.77	.80	.80	.80	.80	.80	.80
Wichita												
Mar. 24	.32	.50	.58	.59	.59	.59	.60	.61	.97	.98	.98	.98
May 27	.30	.56	.74	.80	.93	1.05	1.07	1.22	1.68	1.71	1.71	1.71
Aug. 1	.21	.39	.51	.60	.61	.63	.63	.63	.63	.63	.63	.63
Oct. 4	.44	.72	1.00	1.04	1.16	1.29	1.30	1.30	1.30	1.30	1.30	1.30
Oct. 26	.28	.48	.50	.51	.72	.76	.79	.82	.86	.88	.88	.88
KENTUCKY												
Lexington AP												
Mar. 29-30	.16	.30	.39	.43	.47	.48	.50	.61	.61	.61	.61	.61
July 8	.32	.57	.70	.72	.72	.72	.72	.72	.72	.72	.72	.75
July 21	.55	1.00	1.25	1.40	1.75	1.78	1.88	1.92	1.92	1.95	2.00	2.00
Aug. 8	.35	.65	.75	.78	.78	.78	.78	.78	.85	.87	.87	.87
Sept. 19	.20	.28	.36	.38	.39	.54	.55	.55	.55	.85	.85	.85
Sept. 20	.38	.58	.75	.90	1.35	1.50	1.65	1.77	1.81	1.86	1.96	2.03
Louisville AP												
Apr. 26	.41	.41	.42	.42	.43	.44	.45	.45	.45	.45	.45	.45
Aug. 2	.17	.30	.39	.45	.55	.73	.93	1.05	1.08	1.14	1.15	1.15
Aug. 4	.15	.20	.25	.35	.50	.72	.75	.78	.79	.81	.81	.81
Sept. 19	.30	.45	.49	.51	.64	.99	1.11	1.16	1.16	1.16	1.21	1.22
Sept. 20	.48	.70	.85	1.15	1.24	1.52	1.83	2.00	2.20	2.24	2.31	2.35
Oct. 5	.23	.34	.44	.64	.69	.70	.71	.74	.74	.74	.74	.74
Oct. 11	.47	.51	.59	.62	.62	.62	.62	.62	.62	.71	.71	.71
LOUISIANA												
Lake Charles												
Jan. 10	.22	.24	.35	.40	.52	.60	.64	.71	.77	.77	.80	.81
Apr. 15	.29	.33	.34	.35	.37	.40	.43	.53	.57	.61	.64	.66
May 12	.35	.50	.60	.70	.81	1.30	1.49	1.72	1.78	1.85	1.92	1.94
June 20	.37	.50	.55	.57	.57	.57	.57	.57	.57	.60	1.02	1.03
July 29	.25	.43	.55	.62	.80	.84	.85	.98	1.06	1.08	1.15	1.20
Aug. 29	.23	.40	.55	.64	.68	.69	.69	.69	.69	.69	.70	.71
Oct. 14	.36	.42	.43	.43	.43	.43	.43	.43	.43	.43	.43	.43
Oct. 27	.28	.52	.80	.95	1.07	1.13	1.14	1.42	1.53	1.55	1.57	1.59
Nov. 4	.20	.35	.45	.54	.85	1.10	1.24	1.27	1.29	1.32	1.74	2.22
Dec. 12	.29	.54	.59	.64	.69	.74	.80	.81	.81	.82	.84	.84
Dec. 28	.30	.55	.70	.87	1.03	1.05	1.07	1.10	1.15	1.18	1.18	1.23
New Orleans												
Feb. 20	.28	.48	.59	.63	.74	.93	1.05	1.22	1.25	1.26	1.26	1.27
Mar. 19	.17	.28	.41	.42	.45	.45	.46	.46	.47	.47	.48	.48
May 3	.25	.37	.46	.50	.64	.73	.83	.91	.99	1.06	1.14	1.23
May 12	.44	.65	.74	.79	.82	.86	.90	.98	1.01	1.01	1.02	1.02
May 28	.35	.61	.87	1.06	1.36	1.61	1.82	1.87	1.87	1.87	1.87	1.87
June 7	.19	.25	.36	.40	.45	.63	.82	.82	.82	.82	.82	.82
June 15	.42	.69	.96	1.22	1.42	1.64	1.67	1.68	1.68	1.68	1.68	1.68
July 18	.40	.53	.58	.60	.63	.71	.74	.75	.75	.75	.77	.77
Aug. 22	.31	.51	.56	.73	.73	.84	.85	.85	.85	.85	.85	1.14

** Recorder inoperative--excessive rainfall probable.

EXCESSIVE SHORT DURATION RAINFALL

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
LOUISIANA (Cont'd.)												
New Orleans (Cont'd)												
Aug. 23	0.39	0.74	0.88	1.12	1.45	1.74	1.79	1.82	1.83	1.86	1.86	1.86
Oct. 12	.24	.39	.44	.45	.45	.46	.47	.48	.49	.49	.49	.49
Oct. 13	.34	.67	.89	.94	1.01	1.15	1.20	1.22	1.28	1.30	1.34	1.42
Nov. 4	.40	.57	.62	.68	.77	.88	.95	1.04	1.13	1.23	1.30	1.49
Dec. 12	.17	.21	.28	.38	.52	.68	.82	.95	1.11	1.13	1.19	1.50
MAINE												
Portland Airport												
July 31	.25	.45	.60	.61	.64	.69	.70	.70	.75	.77	.79	.81
Sept. 11	.24	.44	.63	.83	1.18	1.56	2.11	2.58	2.95	3.40	3.94	4.51
Nov. 3	.17	.32	.39	.39	.41	.41	.42	.48	.53	.54	.55	.55
MARYLAND												
Baltimore Airport												
Aug. 3	.12	.19	.27	.36	.51	.65	.67	.70	.73	.75	.76	.76
Baltimore												
May 3	.15	.30	.38	.40	.42	.47	.59	.60	.62	.64	.66	.69
July 5	.30	.55	.70	.70	.70	.70	.70	.70	.70	.70	.70	1.00
Aug. 3	.30	.53	.65	.75	.85	.95	1.15	1.30	1.32	1.32	1.32	1.33
Sept. 19	.45	.50	.55	.60	.60	.62	.64	.64	.64	.64	.64	.64
Frederick Airport												
Feb. 17	.20	.30	.35	.37	.40	.45	.48	.49	.50	.50	.53	.56
Apr. 27	.25	.30	.35	.40	.50	.70	.72	.73	.75	.80	.85	.85
May 3	.30	.40	.73	.85	.93	1.10	1.20	1.22	1.22	1.22	1.22	1.22
June 15	.25	.49	.70	.78	.81	.81	.81	.81	.81	.81	.81	.81
July 15	.17	.25	.32	.32	.57	.67	.87	.92	.93	.94	.95	1.00
Aug. 2	.20	.30	.40	.50	.75	.87	1.08	1.26	1.26	1.26	1.26	1.27
MASSACHUSETTS												
Boston Airport												
May 16	.13	.26	.36	.43	.58	.80	.98	1.35	1.67	1.90	2.23	2.40
Aug. 31	.20	.36	.53	.67	.84	.98	1.08	1.21	1.35	1.48	1.64	1.75
Sept. 11	.25	.40	.52	.60	.70	.87	1.25	1.56	1.82	2.08	2.34	2.65
Nantucket Airport												
Jan. 5-6	.46	.62	.77	.83	.91	.99	1.05	1.11	1.20	1.30	1.36	1.39
Aug. 3	.33	.48	.49	.51	.55	.57	.57	.71	.78	.78	.78	.78
Aug. 31	.23	.36	.51	.61	.68	.80	.94	1.05	1.11	1.14	1.17	1.23
Sept. 21	.33	.56	.73	.89	1.04	1.45	1.63	1.65	1.69	1.69	1.70	1.71
Pittsfield Airport												
May 29	.15	.25	.40	.47	.52	.57	.60	.62	.64	.66	.68	.68
June 14	.25	.50	.50	.50	.50	.62	.65	.65	.66	.75	.85	.93
July 20	.20	.25	.38	.45	.52	.53	.53	.53	.56	.56	.57	.57
July 22	.20	.39	.48	.48	.48	.48	.48	.48	.48	.48	.48	.48
July 29	.35	.63	.80	.88	.92	1.04	1.05	1.08	1.08	1.08	1.13	1.15
Sept. 7	.25	.45	.57	.59	.62	.65	.67	.67	.67	.67	.67	.67
MICHIGAN												
Alpena												
Apr. 7	.18	.25	.32	.45	.56	.63	.66	.67	.68	.68	.70	.70
May 28	.25	.34	.42	.49	.54	.57	.59	.69	.83	1.04	1.22	1.25
June 16	.23	.32	.37	.39	.41	.41	.41	.41	.41	.41	.41	.41
June 19	.34	.45	.56	.66	.69	.70	.74	.74	.75	.76	.76	.76
July 27	.20	.33	.37	.42	.44	.44	.44	.46	.47	.47	.47	.47
Aug. 23	.19	.30	.33	.35	.35	.35	.35	.35	.35	.35	.35	.35
Sept. 19	.20	.30	.32	.33	.50	.56	.57	.62	.62	.62	.62	.62
Detroit Airport												
June 26	.27	.39	.46	.49	.65	.65	.66	.66	.66	.66	.66	.66
Aug. 25	.37	.69	.83	.88	.96	1.01	1.04	1.04	1.04	1.04	1.04	1.04
Sept. 30	.16	.29	.33	.43	.64	.68	.72	.73	.73	.73	.73	.73
Oct. 1	.28	.50	.67	.71	.80	.86	.89	.89	.89	.89	.89	.89
Oct. 3	.16	.31	.40	.47	.58	.73	.95	1.20	1.29	1.37	1.49	1.70
East Lansing												
Sept. 30	.20	.33	.38	.40	.40	.40	.40	.40	.40	.40	.41	.41
Oct. 3	.20	.37	.44	.51	.53	.54	.54	.59	.61	.62	.62	.63
Escanaba												
Apr. 26	.20	.31	.37	.50	.65	.71	.81	.89	.95	.98	1.03	1.06
June 11	.26	.44	.50	.52	.58	.70	.83	.84	.84	.84	.84	.84
June 22	.24	.33	.37	.38	.38	.39	.41	.44	.44	.44	.44	.44
June 24	.21	.30	.35	.36	.38	.39	.43	.47	.48	.51	.52	.53
Sept. 18	.19	.26	.37	.43	.55	.66	.68	.69	.70	.71	.72	.72
Sept. 21	.18	.33	.42	.48	.60	.71	.78	.82	.83	.91	1.14	1.26
Grand Rapids												
March 25	.15	.24	.33	.42	.60	.78	.88	.99	1.14	1.26	1.41	1.59
Apr. 7	.30	.47	.48	.48	.48	.48	.48	.48	.48	.48	.48	.48
Apr. 26	.23	.27	.35	.47	.55	.55	.57	.57	.57	.58	.59	.59
May 31-June 1	.20	.29	.43	.52	.63	.72	.78	.87	.90	1.01	1.01	1.02
June 21	.41	.42	.44	.44	.44	.45	.45	.45	.45	.45	.45	.45
Oct. 3	.32	.59	.71	.92	1.07	1.11	1.16	1.21	1.24	1.24	1.24	1.24
Oct. 3	.24	.44	.57	.62	.79	.84	.89	.90	.91	.91	.91	.91
Oct. 3	.18	.30	.37	.42	.65	.82	.88	1.00	1.01	1.32	1.56	1.69
Oct. 14	.25	.41	.45	.47	.52	.54	.59	.61	.61	.62	.62	.62
Marquette												
June 24	.24	.37	.49	.54	.55	.55	.55	.55	.55	.55	.55	.55
June 29	.21	.34	.47	.54	.55	.55	.55	.56	.56	.56	.56	.56
Aug. 23	.32	.50	.50	.50	.50	.50	.50	.50	.50	.50	.50	.50
Muskegon Airport												
Apr. 7	.36	.36	.36	.36	.36	.36	.36	.36	.36	.36	.36	.36
Apr. 27	.35	.55	.60	.65	.68	.69	.69	.69	.70	.70	.71	.71
May 28	.15	.26	.30	.36	.52	.60	.65	.77	.85	.93	.96	.96
May 31	.25	.40	.41	.43	.56	.63	.65	.74	.78	.78	.80	.83
June 20	.23	.34	.41	.43	.45	.60	.80	.99	1.16	1.25	1.53	1.78
July 3	.20	.40	.59	.62	.63	.68	.78	.86	.91	.96	.98	.98
Aug. 16	.25	.50	.60	.62	.65	.70	.75	.85	.85	.85	.85	.85
Oct. 3	.21	.24	.30	.42	.59	.63	.69	.80	.85	.85	.85	.85
Oct. 3	.41	.61	.70	.82	1.11	1.45	1.45	1.45	1.45	1.56	1.58	1.58
Sault Ste Marie AP												
May 31	.20	.32	.35	.36	.40	.53	.59	.64	.68	.70	.71	.72
June 16	.35	.59	.66	.73	.82	.85	.85	.85	.85	.85	.85	.85
June 24	.22	.42	.60	.68	.74	.81	.84	.86	.86	.90	.95	.95
MICHIGAN (Cont'd.)												
Ypsilanti Airport												
June 19	0.12	0.23	0.35	0.46	0.54	0.58	0.59	0.62	0.63	0.64	0.64	0.65
July 31	.15	.30	.44	.45	.46	.50	.51	.51	.51	.51	.51	.51
Sept. 21	.31	.57	.58	.58	.58	.58	.58	.58	.58	.58	.58	.58
Sept. 30	.23	.45	.68	.90	1.02	1.09	1.11	1.15	1.16	1.16	1.16	1.16
Oct. 3	.17	.30	.38	.42	.44	.44	.44	.44	.44	.44	.44	.44
Oct. 3-4	.20	.33	.42	.60	.74	1.02	1.21	1.59	1.60	1.65	1.94	2.03
Oct. 14	.31	.31	.32	.33	.38	.46	.51	.56	.58	.63	.74	.82
MINNESOTA												
Duluth Airport												
June 11	.20	.34	.40	.55	.89	1.14	1.16	1.17	1.17	1.17	1.17	1.17
June 16	.27	.31	.32	.33	.39	.43	.45	.62	.71	.80	.84	.85
International Falls AP												
June 14	.27	.38	.51	.55	.58	.58	.59	.63	.63	.64	.65	.69
July 31	.25	.37	.40	.50	.59	.73	.76	.76	.76	.76	.76	.76
Sept. 1	.26	.35	.40	.45	.62	.76	.90	.93	.93	.93	.93	.93
Minneapolis AP												
June 19-20	.34	.57	.76	.90	1.40	1.70	2.20	2.37	2.42	2.42	2.44	2.53
Aug. 22	.36	.62	.68	.71	.74	.77	.79	.79	.81	.81	.81	.81
Rochester Airport												
June 18	.25	.34	.46	.49	.49	.49	.54	.61	.68	.68	.69	.83
June 19	.20	.30	.36	.42	.44	.47	.47	.48	.52	.81	.83	.85
July 30	.22	.36	.43	.44	.56	.64	.67	.68	.68	.68	.68	.73
Aug. 8	.26	.36	.38	.41	.46	.48	.49	.49	.49	.49	.49	.49
Saint Cloud												
Apr. 25	.17	.26	.33	.36	.56	.77	.95	1.12	1.15	1.16	1.16	1.17
May 30	.25	.38	.53	.67	.90	1.23	1.45	1.54	1.59	1.68	1.71	1.72
June 17	.75	1.00	1.29	1.39	1.46	1.47	1.52	2.26	2.64	2.65	2.69	2.69
June 24	.75	1.05	1.35	1.55	1.96	2.06	2.07	2.08	2.08	2.14	2.15	2.17
Aug. 15	.42	.77	1.10	1.24	1.32	1.36	1.38	1.38	1.38	1.38	1.38	1.38
MISSISSIPPI												
Jackson Airport												
Jan. 15	.21	.26	.30	.35	.59	.63	.85	.94	1.04	1.11	1.16	1.20
May 1	.40	.70	.90	1.13	1.43	1.81	2.27	2.75	3.06	3.43	3.84	3.95
May 2	.20	.32	.38	.47	.60	.78	.81	.90	.96	1.03	1.15	1.28
May 27	.28	.38	.41	.41	.43	.43	.43	.44	.44	.44	.46	.49
June 14	.19	.31	.39	.49	.57	.60	.61	.62	.62	.62	.62	.62
June 28	.20	.34	.37	.39	.43	.58	.62	.74	.83	.83	.83	.83
July 9	.25	.35	.39	.42	.45	.45	.45	.45	.45	.45	.45	.45
July 16	.25	.44	.59	.67	.72	.77	.78	.79	.79	.79	.79	.79
Aug. 20	.37	.66	.92	1.14	1.54	1.92	1.96	1.99	1.99	2.00	2.04	2.06
Sept. 21	.50	.85	.90	1.05	1.25	1.82	1.90	2.27	2.33	2.34	2.34	2.34
Dec. 28	.25	.37	.42	.43	.54	.69	.71	.73	.78	.83	.91	1.02
Meridian Airport												
Jan. 15	.22	.31	.45	.50	.69	.82	1.01	1.07	1.10	1.18	1.23	1.26
Apr. 15	.27	.34	.51	.58	.75	.90	1.10	1.20	1.22	1.30	1.32	1.38
June 17	.35	.61	.70	.74	.78	.79	.83	.90	.93	.94	.95	.96
July 5	.24	.35	.51	.60	.64	.67	.67	.67	.67	.67	.67	.67
July 8	.29	.52	.68	.75	.82	.87	.91	1.00	1.06	1.08	1.09	1.11
Oct. 5	.22	.32	.35	.38	.40	.41	.41	.41	.41	.41	.41	.41
Oct. 12	.29	.39	.42	.47	.55	.60	.63	.70	.76	.81	.83	.83
Dec. 28	.27	.35	.55	.65	.68	.71	.75	.80	.84	.89	1.00	1.20
Dec. 29	.32	.44	.52	.52	.55	.55	.55	.55	.55	.55	.55	.55
Vicksburg												
Jan. 10	.12	.22	.32	.45	.58	.67	.78	.98	1.12	1.18	1.23	1.23
Feb. 19	.39	.48	.51	.55	.78	1.11	1.17	1.23	1.33	1.33	1.63	1.72
Feb. 27	.32	.42	.47	.52	.52	.52	.52	.52	.52	.52	.52	.52
Apr. 30	.19	.30	.37	.40	.49	.53	.65	.73	.79	.85	.93	1.01
May 2	.22	.42	.56	.68	.84	1.08	1.14	1.21	1.27	1.34	1.41	1.47
May 3	.44	.58	.60	.64	.70	.75	.76	.77	.80	1.02	1.38	1.57
June 19	.27	.31	.31	.31	.32	.37	.37	.37	.37	.37	.37	.37
Aug. 28	.14	.27	.43	.45	.45	.45	.45	.45	.45	.45	.45	.45
Sept. 5	----	.20	.37	.43	.46	.46	.47	.47	.47	.48	.49	.49
Sept. 7	.25	.42	.55	.67	.83	1.27	1.57	1.87	1.90	1.90	1.90	1.90
MISSOURI												
Columbia Airport												
Apr. 30	.47	.85	.92	.95	.96	1.08	1.08	1.10	1.10	1.10	1.10	1.10
May 31	.27	.45	.46	.48	.56	.85	1.02	1.06	1.10	1.11	1.11	1.11
June 9	.14	.27	.39	.45	.57	.61	.62	.90	1.08	1.09	1.09	1.09
Aug. 1	.37	.52	.70	.78	.99	1.05	1.16	1.17	1.19	1.23	1.30	1.35
Aug. 5	.27	.45	.55	.56	.56	.57	.64	.88	.89	.89	.90	.91
Aug. 29	.27	.53	.70	.80	.82	.83	.83	.83	.83	.83	.83	.83
Oct. 11	.47	.62	.70	.72	.77	.82	.85	.88	.97	.98	1.03	1.09
Kansas City AP												
Mar. 24	.16	.31	.44	.59	.86	1.00	1.04	1.05	1.06	1.07	1.08	1.11
May 31	.20	.30	.34	.42	.56	.56	.56	.56	.56	.56	.56	.56
June 9	.14	.24	.36	.38	.43	.43	.43	.43	.43	.43	.43	.43
June 15	.20	.30	.36	.47	.65	.89	.93	1.02	1.10	1.17	1.27	1.28
Aug. 7	.22	.44	.66	.87	1.01	1.04	1.04	1.04	1.06	1.16	1.16	1.16
Oct. 11	.27	.53	.64	.69	.71	.73	.75	.75	.75	.75	.77	.78
Oct. 13	.20	.37	.43	.50	.67	.75	.80	.81	1.22	1.33	1.44	1.47
St. Joseph*												
Mar. 24	.22	.31	.39	.65	.65	.66	.68	.70	.72	.73	.73	.75
Apr. 26	.18	.28	.32	.40	.61	.66	.67	.67	.67	.67	.67	.67
Apr. 29-30	.20	.36	.44	.49	.55	.57	.59	.66	.69	.77	.77	.88
May 31	.25	.38	.45	.55	.69	.76	.78	.80	.81	.81	.81	.81
June 9	.25	.48	.60	.66	.80	1.05	1.15	1.15	1.15	1.15	1.15	1.15
St. Louis												
Jan. 26	.15	.25	.40	.43	.47	.51	.60	.67	.74	.77	.77	.77
Apr. 14	.20	.35	.37	.38	.38	.38	.38	.38	.38	.38	.38	.40
June 15	.24	.37	.42	.45	.48	.52	.55	.58	.58	.58	.58	.77
July 4	.21	.31	.36	.38	.41	.43	.47	.64	.67	.71	.72	.72
Aug. 8	.19	.36	.44	.49	.58	.67	.76	.78	.78	.79	.80	.80
Sept. 19	.35	.35	.35	.35	.35	.35	.37	.37	.37	.39	.40	.41
Sept. 20	.35	.35	.50	.55	.56	.56	.61	.65	.90	1.06	1.23	1.83
Oct. 11	.17	.27	.40	.51	.62	.80	.87	.91	.96	.99	1.05	1.08
Nov. 18	.23	.31	.40	.41	.46	.50	.52	.53	.55	.58	.61	.61

*Recording equipment removed August 1.

Table 8—Continued

EXCESSIVE SHORT DURATION RAINFALL

YEAR 1954

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
MISSOURI (Cont'd.)												
Springfield AP												
Mar. 24	0.36	0.42	0.45	0.50	0.55	0.60	0.70	0.75	0.78	0.00	0.83	0.03
Apr. 11	.25	.35	.44	.48	.53	.55	.65	.07	.08	.88	.91	.94
Apr. 30	.28	.47	.50	.50	.52	.57	.60	.70	.02	.82	.82	.82
May 24	.19	.38	.42	.44	.47	.49	.52	.61	.91	.98	1.01	1.01
May 25	.48	.68	.74	.85	.99	1.20	1.28	1.28	1.28	1.28	1.28	1.28
May 31	.20	.33	.30	.40	.47	.58	.58	.58	.58	.58	.58	.58
July 5	.35	.48	.61	.65	.68	.69	.69	.69	.69	.72	.94	.94
July 7	.28	.40	.40	.40	.40	.40	.40	.40	.40	.40	.40	.40
Aug. 21	.24	.34	.40	.41	.41	.41	.41	.41	.41	.41	.41	.41
Aug. 28	.13	.23	.32	.41	64	.71	.72	.72	.72	.72	.72	.72
Sept. 20	.35	.52	.62	.67	.82	.98	.98	.98	.98	.98	.98	.98
Sept. 28	.25	.45	.52	.58	.64	.64	.64	.64	.64	.64	.64	.64
Oct. 11	.18	.27	.33	.48	.55	.58	.67	.85	.88	.09	.91	.96
Oct. 25	.27	.29	.30	.35	.36	.38	.45	.48	.48	.50	.67	.70
MONTANA												
Billings Airport						None						
Great Falls Airport						None						
Havre						None						
Helena Airport						None						
Kalispell Airport						None						
Missoula						None						
NEBRASKA												
Grand Island AP												
Aug. 18	.34	.60	.82	.83	.83	.84	.84	1.07	1.08	1.09	1.09	1.09
Lincoln												
Apr. 21	.30	.43	.48	.53	.56	.59	.66	.80	.88	.94	.96	.97
Apr. 29	.20	.32	.43	.45	.49	.53	.57	.61	.65	.69	.77	.82
May 23	.23	.40	.62	.80	.90	1.10	1.17	1.19	1.19	1.20	1.21	1.21
June 17	.16	.25	.32	.35	.52	.66	.89	1.02	1.23	1.34	1.49	1.54
July 10	.21	.41	.53	.56	.61	.78	.89	1.19	1.48	1.59	1.59	1.75
July 31	.27	.43	.51	.54	.56	.66	.67	.67	.67	.67	.67	.73
Aug. 1	.28	.36	.45	.70	.79	1.01	1.14	1.18	1.21	1.25	1.37	1.49
Aug. 17	.30	.43	.48	.50	.51	.53	.54	.60	.63	.65	.67	.68
Aug. 22	.27	.40	.47	.65	.70	.71	.72	.79	.82	.83	1.07	1.16
Aug. 22	.23	.35	.37	.38	.46	.74	.76	.76	.77	.77	.78	.81
Sept. 8	.20	.29	.37	.43	.49	.54	.59	.65	.69	.71	.72	.72
Norfolk Airport												
Apr. 14	.20	.25	.32	.40	.53	.58	.62	.76	.80	.85	.91	1.02
May 30	.25	.45	.65	.80	.87	1.00	1.02	1.02	1.02	1.02	1.08	1.65
June 20	.25	.40	.53	.65	.85	.90	1.27	1.34	1.39	1.48	1.52	1.76
North Platte												
Aug. 17	.18	.27	.35	.41	.52	.54	.54	.54	.54	.55	.56	.56
Omaha Airport												
June 21	.34	.40	.58	.62	.75	.92	1.00	1.00	1.00	1.00	1.00	1.00
Aug. 17	.17	.22	.35	.40	.48	.52	.70	.90	.92	.93	1.00	1.07
Aug. 21	.21	.37	.43	.46	.50	.60	.63	.65	.66	.66	.80	.90
Scottsbluff												
May 16	.33	.58	.72	.78	.92	1.06	1.10	1.16	1.25	1.29	1.33	1.38
May 22	.15	.30	.45	.60	.65	.65	.70	.75	.80	.80	.85	.90
June 14	.49	.64	.80	.94	1.07	1.07	1.07	1.09	1.09	1.10	1.11	1.16
June 25	.67	1.02	1.12	1.22	1.37	1.49	1.64	1.68	1.74	1.76	1.77	1.77
July 13	.27	.46	.61	.70	.78	.85	.98	1.07	1.11	1.13	1.14	1.16
Valentine												
June 26	.21	.32	.38	.39	.42	.43	.43	.44	.44	.44	.45	.45
Aug. 11	.19	.34	.38	.39	.42	.66	.67	.67	.67	.67	.67	.67
Aug. 22	.13	.25	.32	.39	.61	.74	.77	.80	.83	.87	.90	.90
NEVADA												
Elko Airport						None						
Ely Airport						None						
Reno Airport						None						
Winnemucca Airport						None						
NEW HAMPSHIRE												
Concord												
June 2	.20	.31	.32	.33	.34	.36	.36	.36	.36	.36	.36	.36
June 28	.28	.34	.35	.36	.38	.40	.42	.44	.44	.45	.49	.52
Aug. 31	.18	.31	.42	.53	.74	1.10	1.39	1.79	2.03	2.23	2.44	2.64
NEW JERSEY												
Atlantic City												
Sept. 10-11	.28	.56	.83	1.00	1.29	1.41	1.63	1.75	1.81	1.85	1.91	2.22
Oct. 29	.16	.32	.42	.46	.54	.61	.67	.75	.79	.81	.84	.84
Newark Airport												
July 14	.21	.36	.46	.51	.57	.59	.60	.62	.66	.67	.68	.69
Aug. 19	.27	.40	.43	.44	.48	.51	.52	.53	.56	.58	.63	.63
Aug. 20	.35	.37	.37	.37	.37	.37	.37	.37	.37	.37	.37	.37
Trenton												
June 11	.25	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30
July 19	.24	.43	.48	.49	.50	.51	.51	.51	.51	.51	.51	.51
Aug. 9	.17	.26	.34	.42	.53	.76	.87	.97	1.12	1.15	1.21	1.22
Sept. 11	.16	.30	.36	.44	.57	.75	.86	.97	1.08	1.26	1.46	1.79
NEW MEXICO												
Albuquerque						None						
Roswell Airport												
May 17	.25	.42	.63	.70	.80	1.14	1.45	1.76	1.96	2.18	2.27	2.36
NEW YORK												
Albany Airport						None						

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
NEW YORK (Cont'd.)												
Binghamton Airport												
May 29	0.33	0.30	0.39	0.41	0.42	0.45	0.55	0.55	0.55	0.55	0.55	0.55
July 25	25	30	.30	.30	.30	30	.30	.31	.32	.32	.32	.32
Buffalo Airport												
June 23	.21	.30	.34	.36	.37	.44	.54	.57	.67	.71	.73	.73
Aug. 24	.17	.23	.32	.46	.52	.61	.63	.65	.65	.65	.65	.65
Oct. 2	.32	.51	.62	.66	.67	69	.69	.69	.69	.69	.69	.73
New York Airport												
June 13	.32	.45	.50	.52	.53	.53	.54	.58	.62	.63	.63	.63
Aug. 3	.22	.34	.51	.66	.88	1.03	1.13	1.21	1.24	1.40	1.43	1.50
Sept. 11	.17	.25	.29	.32	.39	.65	.71	.95	1.09	1.20	1.34	1.51
New York												
June 23	.25	.43	.49	.51	.53	.53	.53	.53	.53	.53	.53	.53
Aug. 19	.19	.33	.40	41	.50	.53	.55	.57	.60	.66	.71	.71
Sept. 11	.24	.28	.36	.41	.53	.66	.85	1.04	1.30	1.57	1.74	2.01
Rochester Airport												
Apr. 27	.28	.35	.30	.38	.39	.44	.45	.48	.51	.52	.52	.52
June 3-4	.25	.35	.43	.45	.48	.50	.55	.60	.64	.66	.67	.67
July 14	.29	.30	.33	.41	.44	.44	.44	.44	.44	.44	.44	.44
Aug. 10	.29	.52	.66	.76	.87	.88	.89	.90	.90	.90	.90	.90
Aug. 24	.30	46	.47	.48	.49	.63	.63	.63	.63	.63	.63	63
Oct. 2	.22	.29	.36	.39	.51	.74	.96	1.01	1.21	1.35	1.41	1.43
Syracuse												
May 3	.23	.44	60	.74	.99	1.30	1.42	1.46	1.50	1.53	1.53	1.75
June 22	.21	.40	.52	.62	.65	.65	.65	.66	.67	.67	.67	.68
July 14	.22	.41	.45	.45	.45	.48	.48	.49	.49	.49	.49	.49
Aug. 30	.26	.38	.55	.73	.93	1.00	1.04	1.09	1.33	1.51	1.67	1.91
NORTH CAROLINA												
Asheville												
June 14	.38	.72	.98	1.10	1.22	1.36	1.38	1.38	1.38	1.38	1.30	1.38
June 16	.12	.22	.31	.40	.55	.58	.62	.62	.62	.62	.62	.62
June 17	.17	.32	.39	.46	.50	.52	.54	.56	.57	.62	.64	.64
July 7	.15	.25	.38	.42	.46	.51	.51	.51	.51	.51	.52	.52
July 9	.31	.48	.55	.59	.63	.65	.66	.66	.66	.66	.68	.68
Oct. 15	.22	.34	.50	.63	.78	.97	1.05	1.20	1.35	1.72	1.81	1.93
Charlotte												
Mar. 13	.35	.50	.65	.70	.88	1.10	1.18	1.30	1.34	1.37	1.59	1.73
Mar. 14	.40	.42	.43	.43	.44	.45	.52	.52	.52	.52	.54	.54
Mar. 31	.25	.40	.48	.52	.55	.62	.65	.65	.66	.66	.66	.66
Apr. 25	.30	.60	.80	1.00	1.30	1.50	1.56	1.56	1.56	1.56	1.56	1.57
July 15	.30	.43	.70	.99	1.03	1.04	1.06	1.07	1.07	1.07	1.07	1.07
July 20	.29	.30	.30	.30	.31	.31	.31	.31	.31	.31	.32	.35
July 22	.43	.62	.67	.67	.68	.68	.68	.68	.68	.68	.68	.68
Aug. 9	.20	.36	.47	.51	.53	.53	.53	.53	.53	.53	.53	.53
Aug. 20	.20	.40	.50	.52	.75	.77	.83	1.10	1.47	1.55	1.69	1.70
Greensboro AP												
Jan. 20-21	.26	.38	.46	.48	.58	.64	.69	.73	.77	.81	.88	1.01
Apr. 16-17	.11	.21	.32	.39	.52	.50	.62	.65	.68	.71	.73	.76
June 9	.19	.31	.39	.43	.56	.77	.81	.84	.87	.89	.90	.91
July 22	.23	.44	.48	.55	.61	.65	.66	.66	.66	.66	.66	.66
Aug. 20	.19	.31	.40	.46	.47	.48	.58	.59	.59	.59	.59	.59
Hatteras												
Jan. 22	.29	.33	.42	.55	.63	.64	.75	.77	.81	.84	.94	1.17
Mar. 1	.20	.35	.52	.59	.67	.73	.76	.77	.78	.81	.81	.81
Mar. 20	.13	.22	.29	.38	.52	.65	.72	.81	.84	.90	.92	.98
May 20	.29	.38	.41	.43	.47	.51	.52	.52	.52	.52	.52	.52
July 6	.20	.37	.45	.52	.76	.88	.93	.96	.97	.98	.98	.98
July 12	.25	.30	.31	.31	.31	.31	.31	.32	.34	.34	.35	.67
July 16	.41	.66	.90	.99	1.01	1.01	1.04	1.44	1.51	1.53	1.59	1.63
Aug. 30	.14	.17	.23	.25	.31	.61	.78	.93	1.13	1.43	1.53	1.64
Aug. 31	.20	.39	.51	.54	.56	.57	.71	.71	.79	.80	80	.87
Sept. 10	.16	.29	.32	.38	.45	.68	.78	.85	.95	1.05	1.08	1.09
Sept. 15	.25	.40	.49	.61	.90	1.14	1.55	1.75	1.82	1.84	1.93	2.06
Sept. 21	.18	.23	.36	.40	.57	.67	.71	.78	.79	.81	.81	.81
Sept. 22	.25	.47	.58	.75	1.08	1.49	1.82	2.05	2.31	2.36	2.36	2.37
Oct. 6	.17	.23	.27	.35	.42	.56	.84	.88	.89	.90	.97	.99
Oct. 15	.25	.31	.34	.36	.39	.39	.40	.40	.40	.48	.70	.76
Oct. 29	.22	.40	.51	.58	.65	.70	.71	.72	.73	.73	.73	.73
Nov. 17	.25	.41	.58	.59	.69	.79	.83	.85	.88	.92	.94	.94
Dec. 9	.26	.38	.38	.38	.39	.43	.43	.44	.46	.47	.47	.47
Raleigh Airport												
Feb. 21*	.30	.49	.63	.72	.85	1.28	1.51	1.77	2.00	2.59	2.82	2.95
Apr. 16	.26	.35	.38	.40	.45	.47	.50	.64	.67	.67	.67	.80
Apr. 17	.15	.24	.28	.33	.45	.65	.73	.80	.80	.80	.82	.90
May 7	.23	.28	.38	.40	.42	.43	.43	.43	.43	.43	.43	.53
July 15	.50	.73	.82	.95	1.00	1.04	1.18	1.80	1.88	1.90	2.07	2.07
July 20	.30	.45	.45	.45	.50	.50	.50	.50	.50	.50	.50	.50
Aug. 2	.40	.50	.56	.56	.56	.56	.56	.56	.75	.83	.83	.83
Aug. 1	.14	.22	.28	.35	.57	.73	.86	.87	.88	.89	.90	.93
Aug. 15	.22	.28	.50	.50	.50	.50	.50	.56	.58	.60	.60	.60
Aug. 17	.15	.25	.27	.40	.45	.48	.49	.52	.53	.55	.55	.57
Aug. 20	.45	.57	.58	.59	.60	.60	.60	.60	.60	.60	.60	.60
Oct. 15	.29	.55	.75	.85	1.20	1.44	1.58	1.71	1.79	2.04	2.16	2.18
Wilmington AP												
Mar. 30	.37	.52	.56	.57	.57	.60	.63	.63	.64	.64	.64	.64
Apr. 16	.27	.40	.57	.73	.80	.86	.86	.86	.86	.86	.86	.86
Apr. 28	.62	.94	1.09	1.14	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.22
May 30	.42	.69	.99	1.24	1.36	1.44	1.45	1.45	1.45	1.46	1.49	1.50
Oct. 14	.14	.25	.36	.40	.50	.56	.62	.66	.68	.94	1.13	1.25
NORTH DAKOTA												
Bismarck												
June 27	.20	.31	.38	.46	.49	.68	.90	1.15	1.22	1.23	1.23	1.23
July 1	.20	.33	.43	.50	.68	.87	1.10	1.32	1.57	1.62	1.68	1.72
July 21	.18	.30	.42	.43	.45	.47	.48	.50	.51	.51	.53	.53
July 28	.28	.42	.60	.71	.73	.73	.73	.73	.73	.73	.73	.73
Devils Lake												
June 11	.27	.44	.62	.80	1.10	1.30	1.56	1.71	1.77	1.82	1.94	2.07
June 14	.20	.31	.35	.38	.40	.43	.46	.53	.58	.63	.73	.76

* City office record.

Table 8—Continued

EXCESSIVE SHORT DURATION RAINFALL

YEAR 1954

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
NORTH DAKOTA (Cont'd.)												
Devils Lake (Cont'd.)												
June 14	0.27	0.32	0.35	0.38	0.45	0.52	0.60	0.68	0.72	0.79	0.91	0.99
June 16	.28	.36	.41	.53	.61	.65	.68	.69	.69	.69	.69	.69
June 28	.18	.30	.39	.40	.44	.46	.46	.47	.78	.80	.80	.80
Fargo Airport						None						
Williston												
June 17	.33	.45	.50	.51	.51	.51	.51	.51	.51	.51	.51	.55
July 21	.23	.35	.43	.49	.49	.49	.49	.49	.52	.68	.71	.72
Aug. 26	.51	.56	.56	.57	.60	.63	.67	.67	.73	.73	.73	.73
OHIO												
Akron Airport												
Apr. 27	.25	.37	.41	.43	.55	.60	.64	.64	.64	.64	.64	.64
June 10	.34	.43	.44	.44	.45	.45	.45	.45	.45	.45	.45	.45
June 13	.28	.55	.58	.58	.62	.83	.89	.89	.90	.92	.93	.93
July 14	.24	.32	.32	.32	.33	.33	.33	.33	.33	.33	.33	.33
Aug. 14	.30	.32	.35	.36	.39	.44	.48	.50	.52	.53	.53	.63
Aug. 16	.80	1.30	1.45	1.57	1.63	1.64	1.64	1.64	1.64	1.64	1.64	1.64
Aug. 24	.29	.32	.51	.62	.72	.75	.77	.77	.78	.80	.80	.80
Oct. 4	.16	.30	.50	.52	.60	.72	.74	.83	.92	.92	1.10	1.24
Oct. 12	.22	.40	.45	.50	.55	.69	.70	.71	.75	.77	.80	.80
Cincinnati Abbe Obs												
Mar. 19	.29	.30	.31	.32	.33	.33	.34	.34	.35	.35	.35	.35
June 8	.27	.51	.68	.86	1.06	1.23	1.24	1.24	1.24	1.24	1.24	1.24
June 15	.36	.67	.85	.90	.97	1.11	1.57	1.69	1.70	1.72	1.74	1.75
June 16	.26	.37	.41	.43	.48	.49	.50	.50	.50	.50	.50	.50
July 3	.22	.30	.33	.33	.56	.59	.62	.63	.63	.63	.63	.63
July 5	.35	.67	.77	.78	.81	.84	.84	.84	.84	.84	.84	.84
Aug. 2	.37	.55	.72	.84	1.16	1.38	1.56	1.66	1.67	1.69	1.81	1.95
Aug. 20	.19	.28	.35	.43	.66	.70	.75	.77	.77	.77	.78	.79
Aug. 26	.24	.39	.46	.47	.47	.48	.48	.48	.49	.59	.81	.81
Sept. 19	.16	.27	.37	.55	.68	.69	.69	.69	.69	.69	.69	.69
Oct. 5	.28	.49	.55	.56	.64	.75	.77	.79	.87	.92	.92	.92
Nov. 19	.22	.37	.45	.46	.49	.51	.54	.54	.54	.54	.54	.54
Cleveland Airport												
Apr. 26	.26	.40	.40	.40	.44	.44	.44	.48	.53	.59	.61	.61
July 31	.30	.47	.62	.85	1.00	1.03	1.05	1.23	1.28	1.28	1.28	1.28
Aug. 14	.23	.45	.50	.52	.53	.61	.71	.77	.85	.97	1.04	1.15
Sept. 30	.25	.38	.41	.44	.54	.59	.62	.62	.62	.62	.62	.62
Columbus												
June 16	.35	.65	.85	1.10	1.47	1.72	1.75	1.80	1.83	1.85	1.86	1.87
July 3	.55	.77	.78	.79	.80	.81	.81	.82	.82	.82	.82	.82
July 20	.20	.30	.40	.50	.60	.65	.75	.84	.89	.95	.97	1.05
Aug. 15	.25	.45	.47	.49	.54	.55	.55	.73	.79	.83	1.07	1.10
Oct. 3	.20	.35	.45	.50	.57	.58	.58	.58	.58	.58	.58	.58
Oct. 3	.32	.57	.59	.61	.64	.78	.80	.90	.95	.96	.96	1.01
Oct. 14	.25	.30	.35	.43	.45	.47	.47	.47	.47	.47	.47	.47
Dayton Airport												
May 2	.31	.47	.48	.48	.48	.48	.48	.48	.49	.62	.62	.62
Aug. 24	.40	.52	.60	.61	.61	.61	.61	.61	.61	.61	.61	.61
Oct. 3	.21	.34	.39	.42	.50	.52	.52	.53	.53	.61	.78	.80
Sandusky												
Apr. 15	.45	.67	.72	.73	.74	.76	.77	.78	.79	.80	.82	.84
Aug. 14	.33	.42	.61	.72	.97	1.32	1.60	1.75	1.86	2.15	2.40	2.65
Aug. 16	.29	.43	.52	.54	.55	.55	.55	.56	.57	.58	.59	.60
Aug. 25	.35	.38	.40	.42	.43	.44	.46	.48	.50	.53	.56	.57
Toledo Airport												
May 1	.17	.28	.35	.36	.37	.37	.39	.41	.41	.41	.41	.41
June 10	.18	.28	.36	.41	.43	.44	.44	.44	.44	.44	.44	.44
June 15	.22	.38	.43	.50	.58	.73	.80	.83	.86	.93	.96	.98
Aug. 14	.26	.35	.39	.40	.41	.45	.46	.69	.74	.78	.78	.79
Oct. 14	.20	.27	.33	.35	.53	.64	.69	.72	.75	.75	.82	.84
Youngstown AP												
June 15	.13	.17	.35	.58	.85	1.27	1.31	1.32	1.32	1.33	1.33	1.35
July 14	.55	.73	.80	.88	1.00	1.00	1.00	1.01	1.01	1.01	1.07	1.07
July 31	.18	.28	.43	.46	.67	.77	.87	.89	.90	.93	.93	.96
Aug. 16	.35	.48	.52	.52	.55	.57	.58	.58	.58	.58	.58	.58
Sept. 30	.32	.51	.70	.95	1.35	1.35	1.35	1.36	1.36	1.36	1.36	1.36
Oct. 4	.20	.24	.27	.40	.43	.46	.48	.58	.70	.78	.92	1.10
Oct. 12	.20	.35	.45	.51	.56	.63	.68	.68	.68	.74	.77	.77
OKLAHOMA												
Oklahoma City AP												
Apr. 14	.20	.30	.42	.54	.70	.76	.77	.80	.82	.85	.88	.88
Apr. 29	.33	.35	.38	.38	.38	.39	.40	.43	.44	.45	.46	.46
May 1	.30	.35	.45	.60	.85	1.05	1.22	1.55	1.55	1.55	1.55	1.55
May 25	.20	.29	.44	.45	.46	.52	.78	.79	.79	.80	.88	.90
July 23	.25	.30	.45	.48	.50	.55	.55	.55	.55	.55	.55	.55
Sept. 30	.21	.38	.46	.49	.50	.51	.51	.51	.51	.51	.51	.51
Oct. 1	.14	.24	.38	.44	.47	.49	.49	.51	.51	.59	.66	.72
Tulsa Airport												
Feb. 19	.25	.32	.48	.54	.59	.63	.78	.78	.80	.82	.82	.82
Mar. 23	.25	.39	.42	.42	.42	.42	.56	.64	.64	.65	.66	.67
Mar. 24	.30	.44	.44	.45	.46	.47	.48	.48	.48	.48	.48	.48
Apr. 11	.33	.46	.50	.50	.50	.50	.51	.51	.51	.51	.51	.51
Apr. 30	.25	.40	.49	.53	.55	.64	.67	.69	.84	1.36	1.54	1.57
May 1	.25	.31	.33	.34	.39	.40	.46	.77	.77	.78	.84	.87
May 6	.30	.37	.39	.40	.54	----	----	----	1.20	----	1.32	----
Aug. 7	.25	.30	.40	.49	.57	.71	.74	.83	.85	.86	.88	.90
Oct. 25	.19	.35	.45	.53	.65	.71	.74	.90	.96	.96	1.02	1.05
OREGON												
Astoria Airport												
Nov. 16	.25	.35	.48	.62	.67	.74	.78	.82	.87	.88	.88	.89
Burns						None						
Eugene						None						
Meacham Airport						None						
Medford Airport						None						
OREGON (Cont'd.)												
Pendleton Airport						None						
Portland Airport												
Aug. 30	0.35	0.41	0.45	0.47	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Portland												
Aug. 30	.36	.46	.55	.57	.59	.59	.59	.59	.62	.65	.65	.65
Roseburg Airport						None						
Sexton Summit						None						
PENNSYLVANIA												
Allentown Airport												
May 29	.25	.41	.57	.65	.70	.72	.72	.77	.78	.79	.80	.83
June 10	.25	.47	.62	.64	.65	.87	.96	1.03	1.07	1.07	1.07	1.07
June 13	.22	.30	.40	.42	.48	.50	.52	.54	.55	.55	.55	.55
Sept. 16	.42	.70	.71	.72	.75	.75	.75	.75	.75	.75	.75	.77
Harrisburg Airport												
May 1	.28	.44	.49	.49	.49	.49	.49	.49	.49	.49	.49	.49
July 1	.31	.60	.80	.83	.87	.89	.90	.90	.90	.90	.90	.90
Aug. 20	.24	.33	.33	.33	.33	.33	.33	.33	.33	.33	.33	.33
Philadelphia												
Apr. 8	.32	.39	.42	.42	.43	.44	.44	.44	.44	.44	.44	.44
May 3	.27	.51	.60	.63	.66	.73	.79	.84	.88	.89	.93	.95
June 23	.25	.36	.50	.70	.73	.75	.75	.75	.75	.75	.75	.75
July 25	.36	.49	.50	.55	.64	.65	.65	.65	.65	.67	.67	.67
Sept. 21	.12	.22	.29	.40	.45	.47	.47	.47	.47	.47	.47	.47
Pittsburgh Airport												
June 10	.46	.68	.87	1.10	1.23	1.30	1.34	1.62	1.62	1.62	1.67	1.67
July 5	.18	.30	.30	.30	.30	.30	.31	.31	.31	.31	.31	.31
July 14	.23	.43	.49	.50	.60	.60	.60	.60	.60	.60	.60	.60
July 19	.25	.48	.55	.55	.55	.55	.55	.55	.55	.55	.55	.55
Aug. 16	.26	.52	.65	.81	.86	.92	1.00	1.00	1.00	1.00	1.00	1.00
Oct. 3	.25	.38	.50	.57	.70	.76	.84	.86	.92	.92	.92	.92
Pittsburgh												
June 15	.14	.28	.36	.52	.63	.63	.63	.63	.63	.63	.63	.63
June 22	.28	.34	.40	.43	.65	.71	.73	.73	.73	.73	.94	1.21
Aug. 9	.31	.46	.60	.68	.70	.70	.72	.72	.72	.72	.72	.72
Aug. 16	.23	.37	.53	.61	.81	.90	.90	.90	.90	.90	.90	.90
Aug. 24	.31	.48	.59	.69	.73	.99	1.00	1.00	1.01	1.01	1.02	1.02
Reading												
Mar. 1	.15	.28	.39	.45	.54	.62	.69	.76	.86	.94	1.03	1.10
May 3	.26	.34	.36	.38	.39	.39	.42	.44	.46	.48	.52	.61
Aug. 19	.21	.33	.43	.45	.46	.46	.64	.72	.77	.81	.82	.83
Scranton												
May 29	.23	.33	.40	.41	.43	.48	.53	.58	.64	.69	.74	.74
June 13	.40	.61	.65	.67	.69	.71	.74	.80	.86	.89	.91	1.07
Aug. 19	.45	.70	.81	.82	.85	.87	.88	.90	.91	.91	.91	.91
Aug. 29	.32	.37	.38	.39	.44	.46	.46	.49	.50	.51	.51	.51
RHODE ISLAND												
Providence AP												
Aug. 10	.28	.42	.57	.67	.88	1.00	1.44	1.56	1.96	2.20	2.25	2.37
Sept. 11	.20	.29	.33	.45	.73	.79	1.02	1.20	1.37	1.71	1.94	2.10
SOUTH CAROLINA												
Charleston												
Mar. 14	.33	.41	.44	.45	.46	.49	.50	.51	.52	.52	.52	.52
May 3	.30	.42	.46	.52	.57	.61	.64	.67	.69	.70	.70	.85
July 4*	.16	.29	.38	.45	.51	.54	.54	.54	.54	.54	.55	.55
July 10	.23	.34	.47	.62	.76	.95	1.36	1.49	1.58	1.60	1.61	1.61
July 10	.16	.29	.35	.41	.49	.54	.64	.72	.74	.77	.84	.86
July 17	.36	.62	.91	1.15	1.45	1.56	1.61	1.62	1.63	1.63	1.63	1.63
Sept. 1	.29	.49	.64	.71	.73	.73	.74	.74	.75	.75	.75	.75
Sept. 15	.25	.40	.49	.51	.64	.79	1.02	1.20	1.27	1.31	1.34	1.37
Sept. 26	.36	.66	.98	1.16	1.55	1.84	1.94	1.95	1.98	2.00	2.01	2.02
Oct. 14	.27	.37	.40	.44	.47	.50	.53	.60	.63	.66	.69	.77
Oct. 15	.17	.27	.41	.50	.63	.72	.84	1.05	1.19	1.32	1.55	1.75
Dec. 13	.20	.30	.39	.47	.53	.59	.67	.73	.78	.86	.97	1.00
Columbia Airport												
Mar. 13	.20	.30	.45	.45	.45	.45	.45	.45	.45	.45	.45	.45
Mar. 31	.25	.40	.42	.43	.44	.44	.44	.44	.44	.44	.44	.44
Apr. 15	.18	.28	.35	.45	.60	.67	.75	.75	.75	.75	.75	.75
July 16	.31	.38	.45	.50	.55	.59	.61	.66	.78	.98	1.03	1.03
July 17	.29	.49	.53	.53	.53	.53	.53	.53	.53	.53	.53	.53
Aug. 3	.60	.75	1.00	1.20	1.30	1.75	2.35	2.48	2.48	2.48	2.48	2.48
Aug. 9	.33	.50	.55	.60	.64	.67	.73	.76	.78	.80	.81	.83
Aug. 28	.26	.52	.78	.87	1.18	1.21	1.22	1.23	1.23	1.23	1.25	1.25
Sept. 20	.35	.65	.70	.71	.75	1.20	1.21	1.21	1.21	1.21	1.21	1.21
Nov. 18	.14	.28	.41	.42	.43	.43	.43	.44	.45	.45	.45	.45
Florence Airport												
Jan. 16	.34	.35	.35	.35	.35	.35	.39	.43	.43	.43	.43	.44
Feb. 21	.20	.30	.36	.36	.36	.36	.36	.36	.36	.36	.36	.36
Mar. 31	.28	.37	.38	.39	.66	.69	.73	.75	.75	.75	.75	.75
May 1	.24	.32	.34	.37	.74	.91	1.01	1.27	1.45	1.53	1.55	1.57
Oct. 15	.16	.27	.38	.45	.55	.82	.92	1.12	1.45	1.72	2.07	2.41
Oct. 29	.21	.35	.43	.48	.50	.50	.50	.50	.50	.55	.55	.55
Greenville Airport												
May 18	.25	.39	.46	.46	.52	.52	.52	.52	.52	.53	.54	.55
June 17	.28	.34	.47	.49	.53	.54	.56	.58	.62	.62	.67	.69
July 14	.26	.52	.73	.89	1.14	1.40	1.49	1.52	1.52	1.52	1.52	1.52
July 26	.20	.35	.46	.50	.53	.60	.60	.61	.61	.61	.61	.61
Aug. 17	.25	.42	.50	.53	.57	.85	.97	.99	.99	.99	.99	.99
Spartanburg												
Mar. 13	.25	.30	.35	.38	.55	.70	.78	.86	.89	.93	1.04	1.09
Apr. 15	.37	.41	.42	.42	.42	.42	.42	.42	.42	.42	.42	.42
Aug. 9	.30	.35	.35	.35	.35	.35	.36	.36	.36	.36	.36	.36

*Data estimated

EXCESSIVE SHORT DURATION RAINFALL

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
SOUTH DAKOTA												
Huron Airport												
May 30	0.40	0.66	0.80	0.84	0.91	0.95	0.99	1.01	1.02	1.04	1.06	1.06
Aug. 22	.26	.33	.48	.64	.80	1.02	1.07	1.10	1.11	1.11	1.11	1.11
Rapid City Airport												
June 5	.35	.68	.83	.91	.96	.99	1.01	1.01	1.01	1.01	1.01	1.01
July 4	.19	.30	.42	.54	.67	.69	.69	.69	.69	.69	.77	.77
Aug. 10	.20	.35	.48	.57	.82	.96	.96	.96	.96	.96	.96	.96
Sioux Falls AP												
May 26	.40	.42	.44	.45	.49	.50	.55	.56	.59	.59	.60	.60
June 6	.26	.51	.51	.51	.51	.51	.51	.53	.53	.53	.53	.53
June 10	.30	.28	.47	.48	.50	.50	.54	.56	.56	.56	.56	.56
June 18	.20	.30	.45	.50	.58	.63	.65	.65	.65	.66	.66	.80
July 29	.37	.53	.88	.97	1.00	1.42	1.55	1.68	1.70	1.70	1.70	1.70
Aug. 26	.25	.40	.44	.46	.50	.51	.51	.51	.51	.51	.51	.51
Sept. 16	.18	.30	.35	.36	.37	.37	.37	.37	.37	.37	.37	.37
TENNESSEE												
Bristol Airport												
Mar. 30	.32	.39	.39	.45	.62	.69	.92	.94	.94	.94	.94	.94
June 13	.50	.85	1.05	1.35	1.90	2.70	3.00	3.07	3.10	3.10	3.10	3.10
June 17	.20	.30	.35	.40	.51	.72	.92	1.02	1.05	1.08	1.17	1.22
July 2	.25	.33	.51	.65	.67	.75	.76	.80	.82	.82	.82	.82
July 21	.28	.42	.45	.61	.73	.84	.85	.88	.89	.90	.91	.93
July 29	.16	.23	.32	.42	.45	.45	.45	.45	.45	.45	.45	.45
Sept. 20	.18	.30	.36	.45	.53	.57	.60	.64	.70	.72	.75	.75
Sept. 21	.14	.20	.33	.42	.47	.50	.52	.53	.53	.53	.53	.53
Sept. 30	.22	.43	.48	.53	.68	.98	1.10	1.10	1.10	1.10	1.11	1.14
Chattanooga AP												
Jan. 20	.29	.49	.64	.70	1.07	1.22	1.34	1.49	1.50	1.51	1.53	1.56
Jan. 21	.29	.45	.47	.49	.63	.69	.83	.94	1.00	1.13	1.25	1.27
Feb. 16	.19	.33	.43	.52	.65	.71	.79	.86	.91	.93	.94	.94
July 25	.42	.82	1.13	1.32	1.69	1.96	2.21	2.25	2.25	2.26	2.28	2.28
Aug. 8	.36	.58	.71	1.03	1.24	1.36	1.38	1.40	1.40	1.62	2.10	2.14
Sept. 20	.33	.61	.74	1.00	1.57	2.07	2.33	2.48	2.57	2.59	2.59	2.59
Oct. 6	.23	.44	.45	.50	.50	.51	.88	.88	.89	.90	.90	.91
Dec. 29	.35	.40	.43	.50	.56	.65	.71	.84	.89	.89	.94	.96
Knoxville Airport												
June 1	.20	.27	.35	.40	.53	.70	.83	.88	.88	.88	.88	.88
July 17	.27	.39	.44	.45	.45	.45	.45	.45	.45	.45	.45	.45
July 26	.26	.39	.44	.50	.90	1.07	1.15	1.15	1.17	1.28	1.53	2.01
Memphis Airport												
Feb. 16	.23	.42	.55	.60	.75	1.12	1.27	1.42	1.61	1.67	2.07	2.30
Apr. 28	.30	.53	.62	.66	.68	.71	.75	.78	.80	.80	.81	.81
Apr. 30	.31	.41	.43	.46	.54	.57	.59	.59	.60	.61	.61	.61
May 2	.16	.28	.40	.48	.51	.57	.58	.59	.60	.61	.62	.64
May 17	.21	.40	.52	.60	.71	.78	.85	.94	1.00	1.03	1.06	1.08
June 3	.28	.52	.62	.65	.68	.70	.71	.71	.72	.72	.72	.72
June 17	.33	.60	.70	.72	.73	.74	.74	.74	.74	.74	.74	.74
June 22-23	.18	.30	.40	.42	.42	.43	.43	.45	.45	.45	.46	.46
Aug. 6	.41	.76	.95	1.15	1.26	1.35	1.39	1.43	1.44	1.46	1.49	1.52
Sept. 29	.25	.32	.33	.33	.45	.51	.52	.53	.53	.61	.63	.63
Dec. 28-29	.26	.27	.28	.29	.30	.40	.42	.43	.52	.58	.59	.63
Nashville Airport												
Mar. 23-24	.30	.39	.41	.42	.55	.70	.83	1.05	1.20	1.31	1.40	1.50
Apr. 6	.24	.31	.42	.46	.47	.54	.59	.63	.70	.70	.70	.70
Aug. 8	.30	.36	.45	.46	.52	.57	.57	.57	.57	.57	.57	.57
Sept. 20	.23	.27	.50	.56	.70	1.10	1.20	1.14	1.45	1.49	1.75	2.16
Sept. 29	.23	.36	.46	.54	.66	.74	.76	.77	.81	.84	.84	.85
TEXAS												
Abilene Airport												
Apr. 29	.38	.73	.79	.87	1.22	1.37	1.40	1.45	1.45	1.45	1.46	1.53
May 6	.26	.46	.51	.51	.51	.51	.51	.51	.51	.51	.51	.51
May 11	.18	.33	.39	.43	.52	.74	.92	1.00	1.05	1.08	1.13	1.13
May 24	.15	.29	.33	.38	.50	.56	.60	.62	.66	.72	.82	.88
Amarillo Airport												
Apr. 25	.25	.29	.34	.35	.38	.43	.52	.60	.63	.63	.65	.65
May 8	.13	.19	.25	.38	.57	.63	.63	.64	.65	.66	.66	.66
June 10	.40	.65	.77	.82	.85	.90	.91	.91	.91	.91	.91	.91
Aug. 7	.11	.21	.29	.40	.51	.56	.57	.57	.59	.59	.60	.66
Austin Airport												
Jan. 9	.13	.22	.34	.41	.48	.49	.51	.51	.52	.53	.54	.54
Apr. 14	.22	.32	.37	.39	.39	.39	.40	.40	.40	.40	.41	.46
Apr. 30	.30	.42	.54	.60	.70	.76	.79	.81	.83	.83	.83	.83
May 11	.30	.40	.42	.43	.43	.44	.69	.75	.75	.76	.76	.76
May 11	.28	.32	.34	.34	.35	.35	.35	.35	.35	.35	.35	.35
May 25	.36	.48	.53	.67	.71	.82	1.18	1.34	1.41	1.50	1.61	1.61
Brownsville AP												
June 24	.48	.60	.64	.64	.67	.67	.67	.67	.67	.71	.71	.71
Sept. 27	.37	.65	.90	1.03	1.21	1.38	1.41	1.45	1.45	1.46	1.47	1.48
Oct. 4	.46	.83	1.20	1.61	2.29	3.09	3.53	4.40	5.19	5.60	5.93	6.01
Oct. 27	.30	.39	.58	.70	.74	.74	.84	.88	.88	.88	.88	.88
Corpus Christi												
Apr. 15	.17	.28	.37	.48	.70	.85	.95	.98	.99	1.00	1.00	1.00
Apr. 28	.33	.63	.85	.87	.93	.93	.93	.93	.93	.93	.93	.93
June 20	.25	.43	.57	.64	.75	.80	.85	.85	.85	.85	1.15	1.16
Sept. 30	.27	.45	.63	.78	1.06	1.11	1.36	1.42	1.62	1.88	1.92	1.98
Oct. 5	.25	.39	.41	.41	.41	.41	.42	.42	.48	.50	.50	.57
Oct. 8	.33	.39	.39	.40	.40	.40	.40	.40	.40	.40	.40	.40
Dallas Airport												
Apr. 11	.39	.62	.80	.88	.93	1.03	1.04	1.04	1.04	1.04	1.04	1.04
Apr. 30	.32	.46	.53	.59	.63	.70	.78	1.24	1.30	1.31	1.32	1.37
May 10	.17	.33	.49	.58	.68	.73	.87	.98	1.07	1.17	1.30	1.53
June 15	.18	.30	.39	.46	.51	.55	.58	.61	.62	.62	.62	.62
June 15	.30	.41	.48	.72	.91	.93	1.07	1.10	1.10	1.10	1.10	1.10
Aug. 22	.23	.38	.50	.58	.76	.97	1.02	1.08	1.10	1.10	1.10	1.10
Sept. 9	.28	.37	.39	.40	.41	.41	.41	.41	.41	.41	.41	.41
Sept. 20	.18	.32	.40	.42	.47	.47	.47	.47	.47	.47	.47	.47
Sept. 29	.25	.38	.45	.52	.61	.67	.68	.71	.74	.77	.80	.82
Sept. 30	.28	.32	.33	.34	.36	.38	.43	.45	.47	.48	.48	.50
Del Rio												
Apr. 8	.26	.40	.51	.64	.72	.74	.74	.74	.74	.74	.74	.74
TEXAS (Cont'd.)												
Del Rio (Cont'd.)												
Apr. 30	0.22	0.33	0.41	0.44	0.61	0.70	0.79	0.83	0.84	0.84	1.00	1.09
May 10	.17	.26	.31	.39	.50	.54	.56	.71	.74	.76	.91	.92
May 24	.20	.32	.42	.50	.62	.65	.67	.70	.70	.70	.70	.71
June 15	.21	.37	.53	.72	1.01	1.32	1.50	1.59	1.61	1.64	1.67	1.68
Oct. 5	.24	.36	.44	.55	.73	.78	.84	.88	.89	.92	.95	1.00
El Paso Airport												
May 20	.52	1.00	1.01	1.01	1.01	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Fort Worth Airport												
Feb. 19	.25	.38	.45	.46	47	.50	.51	.54	.55	.55	.57	.60
Mar. 24	.16	.29	.38	.45	.47	.50	.51	.51	.51	.51	.51	.52
Apr. 11	.29	.42	.59	.69	.74	.77	.80	.81	.81	.81	.81	.81
Apr. 30	.32	.40	.45	.47	.52	.57	.61	.64	.68	.68	.60	.72
May 10	.19	.34	.44	.50	.54	.62	.80	.89	.96	1.04	1.12	1.31
Galveston												
Apr. 15	.24	.39	.41	.41	.42	.47	.55	.59	.65	.70	.73	.75
Apr. 15	.22	.31	.43	.47	.48	.51	.55	.59	.64	.65	.69	.70
June 21	.28	.42	.49	.50	.51	.53	.90	1.00	1.12	1.12	1.13	1.14
July 28	.25	.38	.41	.43	.44	.44	.44	.44	.44	.44	.44	.44
Sept. 28	.17	.29	.39	.42	.42	.45	.49	.49	.49	.49	.49	.49
Oct. 5	.30	.38	.38	.38	.38	.38	.38	.38	.38	.38	.38	.38
Oct. 11	.28	.39	.43	.43	.43	.43	.43	.43	.43	.43	.43	.43
Nov. 3	.34	.53	.70	.85	1.27	1.64	1.94	2.04	2.13	2.17	2.27	2.79
Houston												
Jan. 10	.25	.34	.46	.59	.84	.95	.96	.96	.96	.96	.96	.96
Apr. 8	.38	.61	.89	1.11	1.26	1.32	1.37	1.43	1.47	1.49	1.50	1.57
Apr. 15	.28	.48	.63	.84	1.17	1.24	1.28	1.28	1.28	1.36	1.59	1.59
Apr. 15	.30	.48	.71	.85	1.07	1.09	1.09	1.09	1.09	1.09	1.09	1.09
May 12	.24	.35	.46	.54	.58	.59	.60	.62	.64	.68	.70	.72
May 25	.19	.33	.43	.54	.83	1.15	1.49	1.57	1.59	1.59	1.59	1.59
July 6	.17	.29	.40	.52	.60	.70	.76	.81	.82	.82	.82	.82
July 29	.23	.34	.43	.49	.62	.79	1.01	1.40	1.56	1.68	2.01	2.20
July 30	.35	.50	.56	.57	.59	.60	.61	.61	.61	.66	.77	1.01
Oct. 4	.32	.43	.44	.47	.47	.47	.48	.54	.70	.72	1.10	1.14
Oct. 5	.23	.37	.42	.45	.47	.47	.47	.47	.48	.48	.48	.48
Oct. 22	.27	.46	.56	.67	.78	.89	.98	1.08	1.34	1.43	1.50	1.58
Nov. 3	.17	.32	.37	.41	.44	.50	.54	.57	.58	.60	.60	.61
Dec. 12	.15	.22	.34	.44	.59	.73	.76	.81	.87	.91	.93	.93
Laredo Airport												
May 24	.22	.35	.57	.69	.88	1.03	1.07	1.09	1.11	1.19	1.21	1.21
June 25	.25	.28	.36	.41	.42	.43	.47	.51	.54	.54	.55	.56
June 26	.15	.30	.36	.48	.68	.85	.95	1.06	1.13	1.15	1.17	1.23
July 30	.24	.39	.42	.44	.44	.46	.58	.58	.58	.58	.58	.58
Sept. 6	.40	.55	.65	.77	.80	.82	.82	.02	.82	.82	.82	.82
Sept. 7	.32	.39	.46	.50	.63	.90	.95	.97	.98	.98	.98	.98
Oct. 8	.25	.30	.32	.33	.34	.35	.35	.35	.35	.35	.35	.35
Port Arthur AP												
Jan. 10	.46	.77	.97	1.19	1.43	1.54	1.55	1.58	1.58	1.59	1.59	1.60
Jan. 30	.21	.32	.38	.40	.41	.41	.41	.41	.41	.41	.41	.41
Apr. 14	.36	.54	.61	.66	.73	.77	.77	.77	.77	.77	.77	.77
May 12	.42	.55	.67	.70	.79	.88	.92	.97	1.04	1.09	1.18	1.27
May 25	.42	.73	.95	1.04	1.38	1.86	2.39	2.92	3.16	3.26	3.40	4.41
June 21	.27	.38	.50	.56	.66	.79	.92	1.07	1.07	1.07	1.07	1.07
July 7	.27	.31	.31	.33	.35	.35	.39	.43	.43	.43	.43	.43
Aug. 2	.42	.76	.80	.81	1.06	1.14	1.34	1.35	1.35	1.35	1.35	1.35
Aug. 10	.26	.37	.40	.42	.42	.42	.42	.42	.42	.42	.42	.42
Aug. 21	.24	.34	.34	.35	.36	.36	.36	.36	.36	.36	.36	.36
Aug. 24	.22	.31	.45	.51	.63	.67	.69	.71	.71	.71	.72	.78
Aug. 29	.25	.39	.40	.41	.48	.48	.48	.48	.49	.50	.52	.52
Oct. 12	.34	.34	.41	.63	.67	.81	.81	.81	.81	.81	.81	.81
Oct. 23	.29	.44	.58	.68	.74	.80	.84	.91	1.02	1.07	1.35	1.40
San Angelo Airport												
Apr. 12	.22	.38	.46	.46	.53	.58	.62	.68	.74	.85	.96	1.06
May 18	.20	.32	.39	.42	.48	.58	.64	.72	.80	.85	.91	1.01
May 23	.32	.62	.70	.84	1.18	1.37	1.64	1.81	1.82	1.83	1.83	1.83
May 24	.24	.40	.52	.58	.74	.82	.92	.94	1.00	1.00	1.00	1.00
San Antonio AP												
Apr. 30	.33	.54	.68	.80	.95	1.07	1.09	1.09	1.09	1.09	1.09	1.09
May 11	.22	.34	.45	.53	.57	.80	.61	.61	.61	.61	.61	.61
June 18	.52	.76	.80	.84	.86	.86	.86	.86	.86	.86	.86	.86
June 26	.24	.32	.47	.48	.53	.55	.56	.58	.60	.60	.61	.61
July 31	.20	.31	.37	.41	.47	.51	.55	.55	57	.57	.65	.71
Aug. 31	.15	.22	.28	.33	.49	.67	.69	.72	.74	.76	.77	.77
Oct. 7	.25	.38	.41	.60	.73	.78	.78	.78	.78	.78	.78	.78
Nov. 14	.21	.41	.47	.51	.58	.60	.61	.61	.61	.61	.67	.67
Victoria												
Sept. 30	.25	.45	.65	.80	1.10	1.43	1.48	1.49	1.72	1.72	1.80	1.81
Oct. 22	.55	1.00	1.45	1.63	1.97	2.03	2.13	2.20	2.27	2.27	2.27	2.27
Nov. 14	.83	.85	.86	.86	.86	.86	.86	.86	.86	.86	.86	.86
Waco Airport												
Apr. 27	.15	.25	.40	.45	.50	.54	.55	.57	.58	.62	.65	.66
Apr. 30	.15	.30	.42	.52	.70	.79	.87	1.02	1.09	1.13	1.16	1.20
May 10	.20	.40	.57	.72	1.00	1.30	1.55	1.65	1.70	1.72	1.77	1.78
May 11	.26	.51	.74	.76	.93	.94	.94	.95	.95	.95	.95	.95
Oct. 1	.25	.45	.60	.75	1.15	1.23	1.25	1.25	1.25	1.25	1.25	1.27
Wichita Falls												
Mar. 24	.25	.42	.42	.42	.42	.42	.42	.42	.42	.42	.42	.42
Apr. 22	.25	.40	.45	.55	.71	.93	1.00	1.04	1.10	1.12	1.12	1.12
Apr. 30	.28	.30	.33	.33	.34	.36	.39	.39	.39	.39	.39	.39
May 9	.20	.25	.35	.36	.39	.60	.60	.60	.60	.60	.60	.60
May 26	.20	.35	.51	.57	.65	.68	.69	.70	.74	.83	.93	.96
June 1	.25	.32	.40	.47	.60	.61	.62	.63	.63	.64	.64	.64
June 7	.15	.27	.38	.40	.65	.70	.73	.76	.77	.86	1.18	1.18
June 14	.25	.32	.44	.45	.50	.52	.53	.54	.56	.57	.59	.59
June 15	.20	.40	.53	.55	.65	.75	1.00	1.05	1.05	1.09	1.09	1.09
Oct. 5	.20	.30	.35	.42	.42	.42	.42	.42	.42	.42	.42	.42
UTAH												
Milford Airport												
July 4	.18	.30	.33	.37	.42	.51	.58	.58	.58	.58	.58	.58
Salt Lake City AP												
Aug. 4	.29	.52	.78	.93	1.08	1.24	1.31	1.39	1.45	1.50	1.51	1.53

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
VERMONT												
Burlington												
Sept. 19	0.20	0.38	0.46	0.51	0.68	0.74	0.79	0.85	0.97	1.07	1.15	1.19
VIRGINIA												
Lynchburg Airport												
Mar. 1	.21	.29	.37	.38	.39	.41	.43	.48	.50	.54	.66	.75
June 9	.49	.74	.85	.90	.93	.93	.94	.94	.94	.94	.94	.94
June 10	.32	.61	.83	.96	1.07	1.09	1.09	1.09	1.09	1.09	1.09	1.09
July 20	.20	.30	.32	.34	.38	.43	.46	.48	.50	.50	.51	.52
Sept. 19	.26	.34	.36	.36	.36	.38	.40	.41	.41	.41	.41	.43
Oct. 15	.20	.30	.39	.49	.72	1.00	1.26	1.62	1.91	2.21	2.32	2.50
Norfolk Airport												
Mar. 14	.30	.45	.51	.58	.62	.65	.76	1.00	1.17	1.20	1.23	1.25
Mar. 14	.32	.38	.39	.40	.41	.42	.42	.42	.42	.42	.42	.42
July 5	.37	.51	.53	.54	.54	.55	.56	.56	.56	.56	.56	.56
July 15	.18	.31	.36	.43	.44	.45	.50	.53	.57	.59	.60	.60
July 22	.27	.46	.47	.47	.47	.47	.48	.48	.48	.48	.48	.48
Aug. 2	.22	.36	.52	.57	.63	.67	.68	.68	.68	.68	.68	.68
Aug. 26	.32	.44	.45	.45	.45	.45	.45	.45	.45	.45	.45	.45
Aug. 29	.34	.66	.94	1.14	1.39	1.96	2.16	2.61	2.71	2.72	2.73	2.74
Sept. 26	.21	.32	.36	.36	.37	.37	.37	.37	.37	.37	.37	.37
Richmond Airport												
Apr. 8	.25	.35	.35	.36	.36	.36	.37	.46	.47	.51	.51	.51
Apr. 25	.23	.37	.45	.55	.63	.69	.70	.70	.70	.70	.70	.70
May 3	.20	.32	.34	.35	.36	.36	.36	.37	.39	.41	.43	.44
Aug. 1	.23	.40	.41	.41	.41	.41	.41	.41	.41	.41	.41	.41
Aug. 2	.19	.32	.39	.48	.56	.61	.63	.72	.73	.73	.74	.74
Aug. 19	.27	.48	.59	.60	.61	.61	.61	.61	.61	.61	.61	.61
Oct. 1	.33	.52	.58	.81	1.11	1.17	1.18	1.18	1.18	1.29	1.43	1.46
Oct. 6	.35	.54	.64	.64	.65	.68	.69	.69	.69	.69	.69	.69
Roanoke Airport												
May 29	(.43)	(.48)	(.60)	(.62)	(.65)	.67	.67	.67	.67	.67	.67	.67
June 9	.18	.35	.52	.54	.56	.56	.56	.56	.56	.56	.56	.56
June 14	.25	.40	.63	.70	1.00	1.08	1.10	1.10	1.10	1.10	1.10	1.10
July 19	.17	.30	.40	.52	.75	.85	.91	1.05	1.14	1.22	1.27	1.32
Aug. 22	.14	.27	.35	.43	.55	.61	.67	.80	.93	1.05	1.13	1.14
Oct. 15	.17	.25	.28	.33	.45	.72	.90	1.11	1.32	1.55	1.85	2.15
WASHINGTON												
Seattle						None						
Spokane						None						
Tatoosh Island												
Oct. 20	.11	.21	.30	.39	.53	.64	.65	.72	.76	.78	.80	.82
Nov. 25	.30	.36	.38	.40	.42	.43	.46	.46	.46	.46	.46	.46
Walla Walla						None						
Yakima						None						
WEST VIRGINIA												
Charleston Airport												
June 11	.25	.30	.35	.40	.50	.50	.60	.75	.75	.89	.90	.90
June 16	.45	.65	.90	1.05	1.41	1.59	1.63	1.64	1.66	1.67	1.70	1.71
June 23	.26	.28	.31	.32	.33	.36	.37	.38	.42	.50	.55	.56
July 20	.20	.31	.43	.46	.48	.65	.75	1.00	1.18	1.20	1.50	1.58
Aug. 1	.34	.37	.50	.62	.67	.70	.75	.82	.83	.84	.85	.85
Aug. 5	.25	.40	.45	.50	.60	.80	.83	.85	.85	.85	.85	.85
Sept. 19	.25	.40	.42	.43	.45	.47	.48	.49	.49	.49	.54	.54
Oct. 1	.37	.46	.74	.75	.76	.76	.76	.76	.76	.76	.76	.76
Dec. 29	.45	.47	.53	.55	.55	.60	.60	.60	.60	.60	.60	.60
Elkins Airport												
May 2	.21	.33	.34	.34	.34	.34	.34	.34	.35	.35	.35	.35
June 26	.35	.65	.88	.89	.90	.90	.90	.90	.90	.90	.97	.97
July 3	.17	.30	.37	.44	.47	.48	.50	.56	.59	.59	.59	.59
July 14-15	.25	.47	.61	.85	1.04	1.14	1.15	1.18	1.22	1.28	1.35	1.40
July 15	.27	.52	.57	.67	.80	.93	1.04	1.24	1.29	1.34	1.35	1.36
Aug. 2	.23	.30	.32	.33	.38	.41	.41	.41	.42	.42	.42	.42
Aug. 5	.29	.44	.46	.46	.47	.48	.49	.50	.50	.51	.54	.54
Aug. 19	.29	.37	.40	.46	.49	.50	.51	.51	.82	.86	.92	.93
Aug. 25	.26	.29	.31	.33	.35	.40	.41	.41	.41	.41	.41	.41
Huntington												
Apr. 15	.22	.36	.46	.46	.47	.48	.48	.48	.48	.48	.48	.48
Apr. 22	.25	.37	.40	.41	.42	.42	.42	.42	.42	.42	.42	.42
May 1	.32	.49	.57	.59	.61	.62	.63	.64	.65	.65	.66	.66
July 18	.45	.80	.90	.91	.92	.92	.98	.98	.98	.98	1.20	1.21
July 20	.25	.42	.55	.67	.87	1.01	1.03	1.04	1.04	1.04	1.04	1.04
July 20	.37	.50	.51	.52	.90	1.16	1.23	1.50	1.70	1.90	2.13	2.18
July 21	.28	.52	.65	.73	.77	.82	.86	.88	.92	.97	1.00	1.02
Aug. 2	.45	.67	.77	.79	.88	.97	1.03	1.08	1.10	1.10	1.10	1.10
Aug. 19	.30	.35	.36	.39	.43	.44	.52	.55	.55	.55	.55	.55
Sept. 19	.24	.26	.29	.35	.57	.90	.90	.90	.90	.94	.97	1.05
Sept. 20	.35	.48	.53	.56	.60	.68	.87	.98	1.07	1.17	1.24	1.27
Oct. 1	.30	.55	.65	.91	1.10	1.17	1.21	1.24	1.27	1.27	1.27	1.27
Parkersburg												
Apr. 26	.17	.27	.35	.39	.43	.43	.43	.43	.43	.43	.43	.43
May 1	.26	.30	.32	.35	.62	.66	.66	.66	.66	.66	.66	.66
May 2	.31	.43	.55	.57	.58	.58	.58	.58	.58	.58	.58	.58
June 8	.35	.65	.78	.81	.93	1.12	1.38	1.43	1.45	1.46	1.49	1.49
June 16	.15	.25	.37	.37	.37	.37	.37	.37	.37	.37	.37	.37
June 22	.15	.24	.37	.40	.45	.50	.50	.50	.50	.50	.50	.50
June 26	.38	.60	.67	.73	.80	.80	.80	.80	.80	.80	.80	.80
July 3	.41	.43	.50	.82	1.02	1.03	1.03	1.03	1.03	1.03	1.03	1.03
July 14-15	.21	.35	.37	.42	.54	.80	.87	.95	.98	1.05	1.20	1.30
July 31	.23	.30	.39	.45	.53	.59	.61	.69	.70	.71	.72	.72
Aug. 8	.20	.35	.38	.42	.45	.54	.55	.57	.59	.64	.84	.85
Aug. 19	.26	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30
Aug. 25	.25	.32	.35	.40	.52	.65	.70	.70	.71	.71	.71	.84
Aug. 28	.20	.35	.48	.53	.53	.53	.53	.53	.53	.53	.53	.53
Oct. 3	.43	.50	.51	.51	.51	.51	.51	.51	.51	.51	.51	.51
Petersburg*												
June 15	.25	.46	.62	.72	.75	.75	.75	.75	.77	.77	.77	.77
Aug. 5	.28	.35	.62	.72	.76	1.20	1.25	1.25	1.26	1.27	1.28	1.28
WISCONSIN												
Green Bay												
Apr. 5	0.21	0.34	0.35	0.37	0.47	0.49	0.50	0.65	0.70	0.75	0.88	1.01
May 31	.19	.34	.42	.46	.50	.79	.83	.94	1.10	1.14	1.32	1.76
June 25	.24	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30
July 30	.23	.39	.42	.43	.44	.44	.44	.44	.44	.44	.44	.44
July 30	.27	.35	.42	.45	.49	.53	.57	.62	.64	.64	.65	.65
Sept. 30	.28	.31	.32	.39	.48	.57	.85	.95	1.04	1.08	1.11	1.11
Oct. 2	.23	.34	.43	.56	.72	.74	1.11	1.33	1.67	1.86	2.16	2.27
La Crosse Airport												
Apr. 26	.19	.36	.42	.46	.48	.48	.48	.48	.48	.48	.48	.48
Apr. 30	.25	.37	.42	.46	.70	.88	1.26	1.50	1.70	1.82	2.00	2.02
June 20	.31	.45	.52	.60	.72	.75	.75	.76	1.03	1.10	1.12	1.13
July 3	.20	.40	.55	.64	.67	.68	.81	.88	.91	.95	.96	.97
Aug. 25	.26	.51	.73	.75	.76	.78	.78	.78	.81	.84	.89	.91
Madison Airport												
May 28	.17	.26	.33	.44	.52	.59	.60	.77	.87	1.00	1.11	1.13
June 21	.27	.45	.58	.75	.80	.80	.84	.89	1.10	1.67	1.71	1.72
June 21	.28	.37	.43	.67	.78	.80	.83	.84	.84	.87	.87	.87
June 26	.20	.30	.45	.47	.49	.51	.51	.53	.53	.55	.55	.55
July 3	.44	.70	.86	.95	1.12	1.30	1.55	1.63	1.72	1.80	1.91	1.91
July 6**	----	----	----	----	----	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Aug. 25	.24	.39	.42	.43	.44	.45	.45	.45	.45	.45	.45	.45
Sept. 30	.26	.36	.40	.41	.48	.74	.86	1.01	1.09	1.47	1.55	1.55
Oct. 10	.33	.50	.63	.70	.73	.77	.83	.85	.86	.86	.86	.87
Milwaukee AP												
June 15	.26	.31	.33	.37	.39	.39	.39	.39	.39	.39	.39	.39
June 21	.31	.48	.68	.84	.85	.85	.85	.85	.85	.91	.92	.92
June 26	.45	.65	.90	1.02	1.07	1.08	1.09	1.14	1.14	1.14	1.14	1.14
July 3	.29	.45	.54	.58	.64	.70	.74	.76	.78	.78	.78	.78
July 6	.35	.65	.92	1.00	1.19	1.37	1.60	1.69	1.72	1.72	1.72	1.72
July 30	.26	.30	.31	.32	.34	.38	.40	.42	.73	.75	.90	.90
Aug. 23	.40	.49	.62	.66	.72	.77	.90	.92	.93	.94	.94	.94
Oct. 3	.32	.54	.77	.90	1.02	1.05	1.08	1.09	1.10	1.10	1.10	1.10
WYOMING												
Casper Airport						None						
Cheyenne												
June 14	.20	.36	.43	.43	.44	.45	.46	.46	.46	.46	.46	.46
Lander Airport						None						
Sheridan Airport												
Aug. 6	.23	.36	.44	.49	.53	.59	.60	.60	.60	.61	.65	.65
Aug. 13	.26	.27	.27	.27	.27	.27	.27	.27	.27	.27	.27	.27
ALASKA												
Anchorage Airport						None						
Annette Airport												
Oct. 15	.15	.21	.29	.33	.49	.62	.84	.98	1.13	1.34	1.68	1.86
Fairbanks						None						
Juneau Airport						None						
Yakutat Airport						None						
PUERTO RICO												
San Juan Airport												
Jan. 25	.22	.37	.48	.57	.70	.71	.72	.72	.74	.75	.77	.77
Feb. 15	.22	.35	.39	.42	.44	.45	.45	.46	.47	.47	.47	.83
Feb. 17	.28	.38	.45	.45	.45	.51	.54	.55	.57	.57	.71	.77
Feb. 19	.18	.32	.34	.39	.46	.49	.50	.50	.50	.52	.53	.54
Feb. 21	.22	.35	.40	.44	.61	.73	.89	1.08	1.26	1.33	1.43	1.55
May 3	.40	.61	.89	.93	1.05	1.12	1.12	1.12	1.13	1.13	1.13	1.13
May 17	.18	.26	.31	.46	.53	.56	.61	.70	.73	.74	.80	.82
May 17	.35	.47	.52	.56	.61	.67	.67	.67	.69	.70	.70	.73
June 5	.21	.31	.39	.42	.43	.45	.45	.45	.45	.45	.45	.45
June 6	.25	.36	.45	.47	.48	.48	.48	.52	.52	.52	.52	.52
June 12	.29	.46	.62	.72	.98	1.11	1.18	1.24	1.36	1.40	1.92	2.20
July 30	.31	.43	.45	.47	.50	.53	.55	.60	.78	.83	.85	.90
Aug. 10	.40	.53	.59	.60	.72	.77	.99	1.09	1.13	1.15	1.15	1.15
Aug. 12	.30	.34	.34	.34	.34	.34	.34	.34	.34	.35	.35	.35
Aug. 21	.28	.50	.62	.67	.71	.74	.74	.76	.81	.86	.87	.87
Aug. 30	.40	.43	.43	.45	.45	.56	.57	.58	.60	.60	.60	.68
Sept. 4	.33	.43	.46	.47	.47	.48	.48	.48	.48	.53	.85	1.20
Sept. 15	.25	.35	.38	.38	.49	.49	.53	.80	.86	.92	.98	1.03
Sept. 16	.30	.49	.65	.71	.72	.72	.84	.90	1.08	1.28	1.35	1.68
San Juan												
Jan. 24-25	.20	.33	.50	.63	.63	.63	.65	.67	.71	.71	.71	.76
Feb. 19	.21	.32	.35	.38	.38	.43	.45	.46	.47	.50	.51	.51
May 3	.17	.27	.39	.45	.46	.46	.47	.47	.47	.47	.47	.47
May 17	.30	.55	.59	.60	.66	.71	.71	.71	.72	.72	.73	.75
June 5	.30	.33	.50	.53	.56	.66	.72	.82	.83	.83	.83	.83
June 12	.17	.25	.37	.47	.64	.94	1.17	1.37	1.42	1.47	1.65	1.71
June 27	.32	.45	.47	.48	.50	.50	.50	.50	.50	.52	.52	.52
July 30	.20	.35	.51	.52	.59	.61	.62	.63	.67	.77	.77	.79
Aug. 10	.25	.28	.29	.30	.50	.65	.65	.65	.67	.67	.67	.67
Aug. 20	.27	.31	.32	.45	.56	.70	.81	.94	.94	.94	.98	.98
Aug. 30	.27	.30	.31	.31	.52	.52	.60	.60	.67	.67	.67	.67
Sept. 3	.32	.51	.55	.55	.56	.56	.56	.56	.56	.73	.75	.75
Sept. 3	.40	.68	.79	.81	.84	.84	.84	.84	.84	.84	1.05	1.29
Sept. 16	.40	.65	.70	.73	.73	.73	.73	.80	.95	1.20	1.48	2.08
Dec. 28	.18	.30	.35	.45	.60	.82	.84	.84	.84	.84	.84	.84
Santa Isabel AP#												
Feb. 14	.22	.35	.45	.50	.55	.62	.62	.63	.63	.63	.63	.63
HAWAII												
Hilo Airport												
Jan. 25	.20	.33	.38	.51	.61	.74	.96	1.13	1.28	1.33	1.48	1.55
Feb. 25	.26	.38	.43	.57	.81	1.13	1.48	1.77	2.12	2.65	3.20	3.68
Feb. 25	----	----	----	----	----	----	1.20	----	----	1.87	----	2.17

( ) Estimated

* January through August 30

** Excessive rainfall occurred but not recorded due to instrument failure.

# Station closed March 31.

EXCESSIVE SHORT DURATION RAINFALL

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
HAWAII (Cont'd.)												
Hilo AP (Cont'd.)												
Mar. 1	0.37	0.65	0.86	0.98	1.35	1.82	2.17	2.44	2.80	2.95	3.38	3.58
May 24	.17	.32	.36	.36	.40	.58	.68	.68	.68	.68	.76	.77
Aug. 18	.15	.20	.31	.37	.50	.52	.52	.52	.52	.52	.52	.58
Sept. 21	.15	.28	.37	.40	.45	.57	.71	.82	.92	1.01	1.10	1.17
Oct. 27	.24	.35	.41	.41	.52	.74	.77	.81	.83	.85	.88	1.00
Nov. 27	.25	.35	.42	.42	.55	.85	.92	1.12	1.35	1.59	1.93	2.25
Nov. 28	.46	.70	.83	1.26	1.68	1.85	2.12	2.82	3.17	3.38	3.68	3.78
Dec. 7	.22	.32	.36	.41	.44	.45	.50	.59	.64	.66	.75	.78
Dec. 8	.31	.59	.73	.83	1.09	1.33	1.38	1.67	2.22	2.61	2.63	2.69
Dec. 8	.26	.45	.55	.60	.70	.75	.75	.75	.75	.75	.76	1.91
Dec. 9	.31	.43	.47	.53	.55	.58	.61	.61	.66	.67	.69	1.14
Dec. 9	.36	.66	.77	.98	1.35	1.74	2.11	2.49	2.82	3.21	3.37	3.47
Dec. 11	.36	.64	.72	.93	1.32	1.80	2.29	2.83	3.55	3.63	3.73	3.78
Dec. 11	.40	.49	.54	.62	.76	.98	1.06	1.25	1.62	1.96	2.06	2.45
Dec. 13	.18	.34	.46	.59	.72	.88	1.13	1.26	1.37	1.42	1.56	1.78
Dec. 14	.15	.22	.30	.39	.57	.80	.96	1.18	1.26	1.35	1.47	1.65
Dec. 21	.12	.23	.31	.40	.50	.53	.53	.53	.63	.72	.73	.81
Dec. 27	.15	.22	.29	.36	.50	.70	.80	.80	.84	.89	.89	.89
Dec. 29	.18	.29	.37	.47	.49	.50	.50	.67	.67	.76	.76	.76
Honolulu Airport												
Feb. 26	.25	.30	.33	.35	.40	.44	.49	.75	.80	.86	.93	.97
Nov. 28	.50	.75	1.06	1.18	1.38	1.73	2.53	2.66	2.76	2.79	3.09	3.18
Nov. 29	.40	.70	.85	1.13	1.23	1.79	2.10	2.44	2.53	2.54	2.86	2.93
Dec. 15	.23	.31	.39	.44	.53	.60	.65	.68	.83	.90	.91	.91
Lihue, Kauai AP												
Feb. 28	.28	.39	.39	.39	.40	.40	.40	.54	.58	.59	.59	.62
Feb. 28	.32	.40	.44	.46	.46	.46	.52	.55	.55	.57	.59	.63
Feb. 28	.23	.39	.55	.63	.98	1.34	1.88	2.00	2.07	2.14	2.28	2.32
Mar. 1	.36	.46	.49	.50	.53	.56	.63	.72	.75	.80	1.00	1.05
Apr. 22	.30	.44	.63	.76	.85	.91	.91	.91	.91	.91	.91	.91
Apr. 23	.35	.61	.71	.80	.91	.97	1.00	1.05	1.07	1.07	1.07	1.07
July 30	.55	.99	1.27	1.71	2.21	2.62	3.22	3.94	4.31	4.72	4.85	4.86
Oct. 13	.34	.45	.46	.46	.46	.47	.49	.51	.51	.51	.51	.86
Oct. 14	.21	.32	.45	.55	.57	.59	.59	.59	.59	.59	.59	.59
Nov. 27	.50	.68	.74	1.10	1.42	1.52	1.59	1.76	1.81	1.92	1.96	1.98
Nov. 27	.27	.47	.56	.59	.66	.82	.94	1.13	1.15	1.15	1.16	1.16
Nov. 28	.26	.44	.59	.74	1.03	1.48	1.62	1.72	1.83	2.37	2.68	3.04
Dec. 6	.22	.38	.45	.49	.59	.63	.66	.97	1.05	1.10	1.42	1.42
Dec. 27	.19	.34	.37	.38	.38	.38	.38	.42	.43	.43	.43	.43
PACIFIC AREA												
Canton Island												
July 22	.25	.45	.51	.53	.53	.54	.73	.75	.76	.77	.79	.80

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
PACIFIC AREA (Cont'd.)												
Canton Island (Cont'd.)												
July 26	0.15	0.23	0.33	0.40	0.55	0.57	0.57	0.57	0.58	0.58	0.58	0.58
Wake Island AP												
Jan. 21	.29	.35	.36	.36	.36	.36	.36	.36	.36	.36	.36	.36
Jan. 24	.18	.25	.35	.40	.46	.48	.48	.48	.48	.48	.48	.48
July 15	.17	.27	.37	.47	.61	.69	1.06	1.25	1.33	1.40	1.48	1.54
Aug. 11	.23	.37	.44	.51	.58	.58	.59	.59	.59	.59	.62	.64
Aug. 18	.25	.27	.29	.30	.42	.43	.43	.53	.65	.65	.65	.65
Aug. 20	.20	.36	.38	.38	.38	.39	.39	.39	.42	.42	.42	.42
Oct. 16	.25	.42	.51	.55	.57	.59	.61	.72	.74	.74	.87	.90
Oct. 16	.32	.37	.45	.49	.50	.51	.53	.55	.55	.55	.55	.55
Oct. 17	.23	.37	.43	.44	.44	.46	.47	.52	.52	.53	.55	.55
Nov. 28	.23	.43	.62	.83	1.18	1.47	1.69	2.16	2.37	2.42	2.81	3.31
DELAYED DATA												
Hawaii												
Lihue, Kauai AP												
1951												
Jan. 2	.24	.32	.35	.36	.38	.40	.41	.42	.43	.43	.44	.44
Jan. 21	.21	.30	.34	.36	.57	.68	.71	.76	.78	.81	.81	.81
Mar. 4	.20	.35	.44	.55	.68	1.06	1.15	1.50	1.95	2.00	2.08	2.14
Mar. 11	.30	.52	.67	.79	1.00	1.14	1.24	1.71	2.04	2.16	2.35	2.58
Mar. 12	.36	.43	.44	.46	.49	.51	.52	.65	.73	.74	.76	.78
Mar. 21	.36	.51	.56	.59	.74	.94	1.06	1.24	1.29	1.31	1.34	1.41
Mar. 28	.25	.40	.48	.55	.61	.69	.74	1.26	1.33	1.40	1.46	1.46
Oct. 28	.33	.58	.82	.92	1.05	1.15	1.40	1.70	1.81	2.02	2.42	2.69
Oct. 29	.22	.29	.30	.41	.57	.70	.73	.83	.88	.88	1.00	1.14
Nov. 1	.33	.62	.79	.83	.84	.84	.87	.92	.99	.99	1.00	1.01
Dec. 15	.17	.29	.35	.38	.40	.50	.54	.57	.67	.70	.73	.73
Dec. 16	.20	.34	.41	.44	.47	.72	.76	.86	.95	.99	1.24	1.40
Dec. 17	.26	.39	.50	.56	.66	.80	.86	.88	1.04	1.10	1.36	1.42
1952												
Jan. 2	.20	.34	.42	.45	.51	.62	.71	.78	.80	.97	1.07	1.32
Feb. 10	.21	.31	.33	.35	.36	.38	.39	.40	.41	.41	.41	.41
Mar. 4	.23	.37	.57	.72	.85	.86	.87	.87	.87	.87	.87	.87
Oct. 15	.19	.33	.43	.51	.51	.51	.69	.80	.80	.84	.92	.92
Nov. 20	.32	.48	.57	.81	1.18	1.41	1.46	1.48	1.52	1.53	1.54	1.56
1953												
Jan. 2	.28	.47	.65	.72	1.09	1.29	1.33	1.35	1.35	1.35	1.37	1.40

Table 9

SUNSHINE, AMOUNT AND PERCENT

YEAR 1954

Station	January		February		March		April		May		June		July		August		September		October		November		December		Annual	
	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible
ALABAMA																										
Birmingham	143	45	231	75	216	58	265	68	255	59	366	85	344	79	316	76	292	79	234	67	198	63	150	49	3010	68
Montgomery	159	50	233	75	239	64	273	70	251	59	336	79	308	71	267	89	314	85	302	86	212	67	189	61	3083	72
ARIZONA																										
Phoenix	266	84	296	96	306	82	381	98	410	95	407	95	387	88	396	96	361	97	326	92	302	96	251	81	4089	93
Prescott	204	65	281	92	258	70	353	90	393	91	397	92	305	69	324	78	314	84	314	90	276	89	214	70	3633	82
Tucson	258	81	298	96	306	82	380	98	409	96	411	96	336	77	341	83	329	89	324	92	310	98	267	85	3969	89
Yuma	273	86	300	97	313	84	379	97	416	97	410	96	375	86	395	96	353	95	341	97	306	97	238	76	4099	92
ARKANSAS																										
Ft. Smith	123	39	221	72	177	48	229	58	264	61	345	79	341	77	374	90	313	84	220	63	237	77	156	51	3000	67
Little Rock	107	34	207	68	181	49	235	60	282	65	373	86	347	79	356	85	306	82	216	62	218	70	145	47	2973	67
CALIFORNIA																										
Eureka CO	75	25	105	35	132	36	211	53	243	54	226	50	199	43	145	34	207	55	192	56	86	29	143	49	1964	44
Fresno	190	61	175	57	257	69	340	86	412	94	413	94	430	97	410	98	366	98	339	97	166	54	104	35	3602	81
Los Angeles CO	215	68	271	88	232	62	232	59	277	64	301	70	361	82	293	71	316	85	287	82	231	74	242	78	3258	74
Red Bluff	129	42	188	63	241	65	278	70	412	92	355	79	439	96	369	87	362	97	297	86	144	48	120	41	3334	75
Sacramento	117	38	132	44	184	50	282	71	373	84	370	83	429	95	370	87	365	98	313	90	141	47	73	25	3149	71
San Diego	211	66	250	81	212	57	192	49	198	46	214	50	271	62	263	64	290	78	238	67	235	75	214	69	2788	63
San Francisco CO	145	47	234	77	228	61	260	66	349	79	355	80	320	71	220	52	303	81	301	86	196	64	186	62	3097	70
COLORADO																										
Denver	203	67	260	87	232	63	292	73	293	66	358	80	323	71	328	77	285	76	253	73	237	79	227	78	3291	74
Grand Junction	156	51	239	79	207	56	300	76	344	78	337	76	344	76	331	78	263	70	271	78	222	74	189	64	3203	72
Pueblo	226	74	263	87	244	66	297	75	254	57	406	91	369	82	334	79	288	77	262	75	286	94	238	81	3467	78
CONNECTICUT																										
Hartford 1/	100	34	155	52	234	63	243	60	251	56	318	70	326	71	170	57	190	51	179	52	121	41	118	42	2405	54
New Haven	133	45	168	56	250	68	231	58	212	47	277	61	308	67	253	59	219	58	220	64	167	56	159	55	2597	58
FLORIDA																										
Apalachicola CO	149	46	214	69	211	57	303	78	303	71	343	81	291	68	338	83	259	70	310	87	190	60	165	52	3076	69
Jacksonville	150	46	216	69	245	66	210	54	272	64	259	61	270	63	272	66	172	47	240	68	198	62	179	56	2683	60
Key West CO	255	76	228	72	283	76	310	81	307	74	299	73	299	72	250	62	210	57	220	61	215	66	257	78	3133	71
Lakeland CO	214	65	228	73	271	73	174	45	228	54	208	50	195	46	228	56	195	53	211	59	195	61	192	60	2539	58
Miami CO	259	78	261	82	313	84	266	69	252	61	235	57	285	68	321	79	276	75	221	62	248	76	273	83	3210	73
Pensacola CO	169	52	228	73	233	63	303	78	306	72	349	83	281	65	341	83	295	80	291	82	212	66	198	63	3206	72
Tampa	238	73	259	82	294	79	257	67	321	76	313	75	277	65	310	76	266	72	303	85	215	67	238	74	3291	74
GEORGIA																										
Atlanta	142	45	203	66	219	59	240	61	267	62	347	81	325	74	317	76	293	79	253	72	159	51	140	45	2905	64
Macon	184	58	219	71	246	66	285	73	304	71	386	90	312	71	353	85	312	84	302	86	199	63	213	69	3315	74
Savannah	174	54	223	72	229	62	226	58	260	61	329	77	346	80	348	84	263	71	279	79	203	64	203	65	3083	69
IDAHO																										
Boise	90	31	170	58	211	56	293	73	397	87	350	76	426	91	393	91	352	94	289	85	178	61	134	48	3283	73
Pocatello	48	17	177	60	194	52	294	73	359	80	246	54	338	73	332	77	305	81	252	74	213	73	133	47	2891	63
ILLINOIS																										
Cairo CO	135	44	185	61	200	54	254	65	277	63	363	83	381	85	311	74	296	79	180	52	157	51	139	46	2878	65
Chicago	114	38	155	52	370	55	184	46	277	61	319	70	328	71	255	59	248	66	140	41	138	47	103	36	2631	55
Moline	133	45	135	45	192	52	202	51	256	57	311	69	321	70	263	61	251	67	169	49	124	42	97	34	2454	55
Peoria	123	41	151	51	210	57	252	63	287	64	342	76	356	78	271	64	281	75	172	50	123	41	98	34	2666	60
Springfield	116	38	162	54	197	53	268	67	315	71	330	74	370	81	284	67	293	78	200	58	150	50	94	32	2779	60
INDIANA																										
Evansville	119	39	151	50	223	60	260	66	289	65	361	82	359	80	288	68	292	78	193	56	152	50	89	30	2776	60
Ft. Wayne	87	29	108	36	172	27	173	43	381	63	335	74	339	74	252	59	221	59	137	40	132	44	92	32	2429	52
Indianapolis	123	41	155	52	215	58	223	56	233	52	310	69	403	89	328	77	300	80	199	58	141	47	111	38	2741	62
Terre Haute	104	34	144	48	158	42	209	53	258	58	324	73	376	83	---	--	---	--	---	--	---	--	---	--	----	--
IOWA																										
Burlington	184	62	202	68	232	63	273	68	321	72	372	82	363	79	309	72	299	80	222	65	194	65	140	48	3111	69
Des Moines	153	52	182	61	205	55	250	62	270	60	316	70	316	69	250	58	261	70	170	49	197	67	118	41	2688	60
Sioux City	166	57	180	61	179	48	269	65	325	72	295	64	353	76	259	60	270	72	123	36	206	70	151	53	2776	62
KANSAS																										
Concordia CO	189	63	241	81	241	65	248	62	225	51	354	79	359	79	246	58	310	83	188	54	210	70	193	66	3004	67
Dodge City	197	64	253	84	257	69	289	73	241	55	377	83	371	83	340	81	333	89	271	78	258	85	215	72	3402	76
Topeka	150	50	195	65	184	50	222	56	242	55	315	71	331	73	236	56	284	76	148	43	210	70	159	54	2676	60
Wichita	208	68	268	89	256	69	263	67	281	64	399	90	411	92	350	83	333	89	230	66	260	85	226	76	3485	78
KENTUCKY																										
Louisville	125	41	169	56	215	58	274	69	269	61	353	80	373	83	246	58	291	78	210	60	133	44	84	28	2742	62
LOUISIANA																										
New Orleans CO	160	49	243	78	239	64	255	66	268	63	312	74	246	57	310	76	261	70	251	71	215	67	173	55	2933	66
Shreveport	116	36	256	83	232	62	270	69	279	65	368	86	312	72	348	84	303	82	257	73	278	88	203	65	3222	73
MAINE																										
Portland	139	48	137	47	228	62	235	58	191	42	236	51	273	58	255	59	224	60	182	53	158	54	141	51	2399	54
MARYLAND																										
Baltimore	157	52	200	67	241	65	243	59	231	52	333	75	367	81	266	63	261	70	205	59	139	46	129	44	2772	61
MASSACHUSETTS																										
Blue Hill Observatory	93	33	125	44	204	57	193	50	177	40	233	53	265	60	216	52	176	49	166	50	143	51	112	41	2103	49
Boston	128	44	156	53	260	70	214	47	214	47	265	58	343	74	287	67	225	60	231	67	182	62	151	53	2656	60
Nantucket	114	38	131	44	227	61	253	63	250	55	319	70	320	70	301	70	333	62	199	58	134	45	93	32	2674	58
MICHIGAN																										
Alpena CO	101	35	107	37	199	54	217	54	304	66	294	63	358	76	293	67	163	43	159	47	82	29	65	24	2342	52
Detroit	95	32	134	45	184	50	209	52	288	64	310	68	338	73	317	74	204	54	142	41	121	41	85	30	2427	54
Escanaba CO	117	41	157	54	230	62	220	54	280	61	297	63	319	67	295	68	132	35	141	42	69	24	59	22	2316	52
Grand Rapids	63	21	82	28	163	44	151	38	245	54	274	60	304	65	270	63	172	46	146	43	118	40	72	25	2060	44
Lansing 2/	89	30	128	43	205	55	176	44	271	60	294	64	339	73	265	62	203	54	141	41	100	34	75	26	2286	51
Marquette CO	76	27	103	36	185	50	222	55	246	53	302	64	324	68	288	66	149	40	146	43	72	26	65	24	2178	49
Sault Ste. Marie	86	31	92	32	179	48	170	42	246	53	219	46	315	66	240	55	96	26	116	34	64	23	71	26	1894	42
MINNESOTA																										
Duluth	120	43	168	58	239	65	199	49	207	44	277	59	310	65	274	62	147	39	149	44	91	32	117	44	2298	51
Minneapolis	115	40	136	47	197	53	206	51	251	54	259	56	281	59	267	61	147	39	138	41	118	41	113	41	2228	50
MISSISSIPPI																										
Jackson	128	40	234	76	218	59	275	71	253	59	251	82	301	69	345	84	290	78	244	69	222	70	174	56	2935	69
Vicksburg CO	104	33	223	72	211	57	270	69	267	62	365	85	302	69	307	74	270	73	218	62	224	71	183	59	2944	66
MISSOURI																										
Columbia	170	56	211	70	239	65	292	74	334	75	362	81	392	87	279	66	289	77	175	50	197	65	120	41	3060	69

See reference notes at end of table.

SUNSHINE, AMOUNT AND PERCENT

Station	January		February		March		April		May		June		July		August		September		October		November		December		Annual	
	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible
MISSOURI (Cont'd.)																										
Kansas City	141	46	203	68	203	55	208	52	254	57	344	77	377	83	304	72	310	83	155	45	205	68	125	42	2829	64
St. Joseph	174	58	207	69	217	58	251	63	297	67	362	81	379	83	---	--	---	--	---	--	---	--	---	--	----	--
St. Louis CO 3/	152	50	206	69	234	63	287	72	277	63	346	78	365	81	231	55	270	72	196	57	154	51	131	44	2849	64
Springfield	131	43	202	67	213	58	296	75	298	68	362	82	386	86	332	79	319	86	197	56	233	76	134	45	3103	70
MONTANA																										
Billings	141	50	167	58	216	58	241	59	270	58	306	65	376	79	341	78	26'	69	250	74	147	52	191	70	2907	65
Great Falls	107	39	139	48	190	51	224	55	294	63	296	62	406	84	306	69	261	69	212	63	137	49	163	62	2735	61
Havre CO	89	33	141	49	176	48	144	35	220	47	223	46	364	75	255	57	209	55	175	52	98	35	145	56	2239	50
Helena	117	42	183	63	236	64	273	67	333	72	301	64	368	77	285	65	244	65	259	77	179	63	159	59	2937	66
Missoula	62	22	110	38	196	53	200	49	304	65	236	50	381	79	281	64	273	72	224	66	166	59	124	47	2557	57
NEBRASKA																										
Lincoln CO	176	59	212	71	218	59	267	67	288	64	367	81	368	80	263	62	302	81	163	47	227	76	187	65	3038	68
North Platte	162	55	218	73	206	56	247	62	257	57	324	72	361	79	263	62	269	72	164	48	214	72	174	60	2859	64
Omaha	185	62	205	69	184	50	269	67	326	72	353	78	320	70	194	45	241	64	127	37	208	70	147	51	2759	62
Valentine CO	184	63	239	81	223	60	284	71	336	74	310	67	395	85	292	68	280	75	224	65	225	77	179	64	3171	71
NEVADA																										
Ely	169	56	250	83	254	69	311	78	340	76	326	73	359	79	365	86	316	85	293	84	229	76	192	65	3404	76
Las Vegas	249	80	283	93	297	80	364	93	409	94	389	89	360	81	366	87	337	91	324	93	243	79	247	82	3868	87
Reno	172	57	232	77	199	54	301	76	386	87	327	73	414	91	406	96	366	98	316	91	241	80	225	77	3585	80
Winnemucca	118	40	227	76	235	64	303	76	391	87	335	74	406	89	381	89	362	97	312	91	210	71	169	59	3449	77
NEW HAMPSHIRE																										
Concord	106	37	132	45	210	57	214	53	166	37	193	42	289	62	227	53	174	47	160	47	117	40	89	32	2077	46
Mt. Washington Obs.	102	35	106	36	107	28	166	40	124	27	114	24	97	20	97	22	64	17	87	25	93	31	95	33	1252	28
NEW JERSEY																										
Atlantic City CO	152	50	212	70	241	65	274	69	230	52	347	78	369	81	280	66	241	65	257	74	177	59	141	48	2921	66
Trenton CO	145	48	181	60	228	62	245	62	220	49	323	72	336	74	260	61	229	61	215	62	164	55	141	49	2687	60
NEW MEXICO																										
Albuquerque	211	67	282	92	268	72	342	87	345	79	393	90	357	81	332	80	304	82	300	86	288	93	226	74	3648	82
NEW YORK																										
Albany	104	36	113	38	174	47	200	50	209	46	234	51	261	56	207	48	129	34	167	49	105	36	90	32	1993	45
Binghampton	99	33	117	39	182	49	210	52	270	60	281	62	309	67	201	47	171	46	133	39	97	33	56	20	2126	48
Buffalo	95	33	97	33	179	48	204	51	339	74	310	67	352	76	262	61	181	48	141	41	94	32	53	19	2307	50
New York CO	143	48	165	53	240	65	253	63	231	52	305	68	328	72	250	59	214	57	218	63	175	59	176	60	2698	60
Rochester	94	32	95	32	153	41	196	49	301	66	284	62	343	74	251	58	158	42	137	40	112	38	87	31	2211	47
Syracuse	127	44	115	39	173	47	217	54	285	63	277	60	351	76	238	55	158	42	137	40	91	31	94	34	2263	50
NORTH CAROLINA																										
Asheville CO	155	50	194	64	244	66	261	67	287	66	326	75	327	74	299	72	301	81	267	76	183	59	164	54	3008	67
Charlotte	164	53	211	69	248	67	269	69	308	71	372	86	329	74	321	77	323	87	287	82	157	51	184	60	3173	71
Greensboro	147	47	191	63	224	60	249	63	267	61	343	78	326	73	294	70	316	85	307	88	212	69	221	73	3097	70
Hatteras CO	148	47	162	53	177	48	227	58	235	54	298	69	265	60	299	72	242	65	225	64	176	57	165	54	2619	58
Raleigh CO 4/	161	52	201	66	204	55	251	64	---	--	---	--	359	84	285	68	263	71	253	72	187	61	219	72	----	--
Wilmington	188	60	202	66	251	67	272	70	293	68	356	82	285	65	357	86	275	74	284	81	210	67	215	70	3188	71
NORTH DAKOTA																										
Bismarck	131	47	176	61	227	61	234	57	299	64	268	57	337	71	307	70	216	57	176	52	177	63	183	68	2731	61
Devils Lake CO	139	50	164	57	258	70	221	54	296	63	277	58	337	70	258	58	205	54	193	57	124	45	147	56	2619	59
Fargo	121	43	184	64	205	55	193	47	283	61	265	56	308	64	302	69	198	53	168	50	143	51	140	53	2510	56
Williston CO	139	50	165	57	197	53	248	61	291	62	287	60	375	78	276	63	204	54	202	60	153	55	171	65	2708	61
OHIO																										
Cincinnatti Observatory	108	36	138	46	170	46	245	62	254	57	321	72	371	82	267	63	297	80	174	50	128	42	94	32	2567	56
Cleveland	70	24	94	31	179	48	203	51	271	60	266	59	323	70	214	50	214	57	133	39	104	35	59	21	2130	45
Columbus	114	38	142	48	185	50	257	64	276	62	330	73	377	83	282	66	292	78	174	50	130	43	95	33	2654	60
Dayton	127	42	155	52	234	60	275	69	275	62	319	71	391	86	290	68	310	83	190	55	136	45	120	41	2822	63
Sandusky CO	90	30	141	47	223	60	240	60	291	65	328	72	340	74	263	62	231	62	140	41	145	49	79	28	2511	54
Toledo	76	26	106	36	175	47	202	50	257	57	300	66	333	72	299	70	259	69	165	48	104	35	71	25	2347	53
OKLAHOMA																										
Oklahoma City	176	56	258	85	223	60	262	67	242	56	382	88	388	88	345	83	328	88	221	63	250	81	208	68	3283	74
Tulsa	136	44	244	80	205	55	229	58	241	55	368	84	395	89	376	90	327	88	251	72	255	83	202	67	3229	72
OREGON																										
Portland	60	21	132	46	211	57	233	57	269	58	187	40	273	58	174	40	175	46	141	41	51	18	37	14	1943	43
Roseburg	77	26	110	37	167	45	230	57	251	55	176	38	321	69	236	55	201	54	157	46	82	28	63	22	2071	46
PENNSYLVANIA																										
Harrisburg	112	37	139	46	179	48	208	52	228	51	328	73	358	79	245	58	244	65	189	55	125	42	128	44	2483	56
Philadelphia CO	136	45	189	63	243	66	263	66	251	56	326	73	306	67	217	51	209	56	163	47	132	44	114	39	2549	57
Pittsburgh	112	37	116	39	177	48	248	62	302	68	309	69	350	77	220	52	207	56	168	49	123	41	77	27	2409	54
Pittsburgh CO	69	23	85	28	154	42	212	53	220	49	274	61	315	69	247	58	216	58	119	34	84	28	47	16	2042	46
Reading CO	117	39	126	42	196	53	209	52	172	38	299	66	302	66	221	52	200	54	158	46	135	45	119	41	2254	50
Scranton CO	90	30	121	41	187	50	216	54	239	53	303	67	332	72	227	53	198	53	178	52	109	37	93	32	2393	50
RHODE ISLAND																										
Providence	122	41	153	51	254	69	250	62	183	40	234	51	243	53	224	52	170	45	179	52	158	53	129	45	2299	52
SOUTH CAROLINA																										
Charleston CO	182	57	231	75	245	66	267	68	311	73	375	87	346	79	352	85	279	75	290	82	229	73	229	74	3336	75
Columbia	200	63	256	83	264	71	281	72	305	71	370	86	356	81	371	89	292	79	275	78	194	62	218	71	3382	77
Greenville	181	58	220	72	242	65	237	60	302	70	337	78	297	67	300	72	308	83	289	82	191	62	189	62	3093	69
SOUTH DAKOTA																										
Huron	137	48	175	60	204	55	229	57	323	70	293	63	370	79	331	76	228	61	158	46	190	66	128	46	2766	62
Rapid City	143	50	172	59	170	46	184	46	226	49	244	53	344	73	278	64	244	65	198	58	180	62	158	57	2541	57
TENNESSEE																										
Chattanooga	141	45	218	71	218	59	281	72	284	65	335	77	331	75	285	68	273	73	197	56	173	56	142	47	2878	64
Knoxville	151	49	169	55	174	47	336	85	242	56	297	68	307	69	205	49	264	71	218	62	138	45	76	25	2577	58
Memphis	118	38	210	69	197	53	272	69	280	64	387	89	396	90	362	87	304	82	214	61	234	75	169	56	3143	71
Nashville	159	51	194	64	166	45	234	59	204	47	325	74	316	71	271	65	274	74	200	57	183	59	125	41	2651	59
TEXAS																										
Abilene	165	52	280	91	256	69	281	72	336	78	386	90	422	97	378	92	347	93	282	80	272	86	241	77	3646	82
Amarillo	242	77	251	82	234	63	274	70	247	57	388	89	383	87	341	82	311	84	284	81	267	86	179	59	3401	76
Austin	142	44	229	73	190	51	163	42	277	65	337	80	359	83	341	83	318	86	265	75	249	78	193	61	3063	67
Brownsville	170	51	228	72	230	62	288	75	332	80	287	70	331	79	307	76	248	67	250	70	219	67	227	70	3117	70
Corpus Christi	140	43	242	77	177	48	207	54	323	77	325	78	380	89	394	97	315	85	269	76	248	77	211	65	3231	72
Dallas	131	41	255	83	213	57	194	50	237	55	383	89	337	77	319	77	341	92	252	72	243	77	192	62	3097	70
Del Rio	152	47	237	76	227	61	163	42	270	64	217	52	359	84	302	74	314	85	235	66	262	82	222	70	2960	67
El Paso	269	84	287	93	298	80	349	90	403	94	407	96	393	90	323	78	336	91	319	90	302	96	275	88	3961	89
Galveston CO	114	35	237	76	178	48	230	60	297	70	341	81	352	82	351	86	316	85	283	80	240	75	194	61	3133	70
Houston CO	107	33	239	77	185	50	214	55	359	85	347	82	314	73	335	82	319	86	266	75	252	79	215	68	3152	70

See reference notes at end of table.

Table 9—Continued

SUNSHINE, AMOUNT AND PERCENT

YEAR 1954

Station	January		February		March		April		May		June		July		August		September		October		November		December		Annual	
	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible
TEXAS (Cont'd.)																										
Port Arthur	103	32	219	70	153	41	193	50	339	80	365	87	293	68	313	76	298	81	260	73	227	71	186	58	2949	66
San Antonio	159	49	236	75	223	60	220	57	314	74	316	75	357	83	339	83	324	87	273	77	250	78	221	69	3232	73
UTAH																										
Salt Lake City	122	41	119	40	200	54	293	73	342	76	325	72	394	86	362	85	304	81	289	84	247	83	162	56	3159	71
VERMONT																										
Burlington	131	46	131	45	187	51	208	51	217	47	223	48	313	67	276	64	193	51	142	42	86	30	66	24	2173	47
VIRGINIA																										
Lynchburg	155	51	196	65	231	62	279	71	277	63	348	79	348	78	275	65	301	81	249	71	150	49	172	58	2981	67
Norfolk	182	59	224	74	217	59	232	59	221	50	333	76	327	73	247	59	245	66	265	76	176	57	179	60	2848	64
Richmond	143	47	183	60	243	65	270	68	282	64	324	73	330	74	253	60	285	76	245	70	153	50	169	57	2880	65
Washington Nat'l. Airport	146	48	176	59	211	57	229	58	252	57	328	74	332	73	273	65	278	74	217	63	145	48	139	47	2726	61
WASHINGTON																										
Seattle CO	58	21	63	22	191	52	164	40	242	52	198	42	258	54	136	31	150	40	119	35	37	13	62	23	1678	37
Spokane	49	18	120	42	248	67	250	61	272	58	272	57	372	77	283	64	269	71	196	58	74	26	103	39	2508	56
Tatoosh Island	47	17	42	15	193	52	168	41	214	45	139	29	167	35	69	16	120	32	126	38	53	19	60	23	1398	31
Walla Walla CO	51	18	52	18	227	61	240	59	307	66	253	54	399	84	322	74	272	72	215	63	76	27	53	19	2467	55
WEST VIRGINIA																										
Elkins	97	32	117	39	172	46	229	58	194	44	284	64	311	68	---	--	---	--	---	--	---	--	---	--	----	--
Parkersburg CO 5/	86	29	127	42	180	49	238	60	260	59	331	74	330	73	---	--	279	75	144	41	97	32	---	--	----	--
WISCONSIN																										
Green Bay	108	37	174	59	219	59	206	51	247	54	285	61	301	64	255	59	145	39	151	44	134	46	89	32	2314	52
Madison	134	46	173	59	250	68	207	51	260	57	319	69	338	73	290	67	221	59	188	55	131	45	112	40	2623	59
Milwaukee	131	45	151	51	222	60	194	48	290	64	319	70	316	68	317	74	221	59	182	53	149	51	104	37	2596	58
WYOMING																										
Cheyenne	192	64	237	80	167	45	299	75	265	59	312	69	306	67	254	68	259	69	245	71	208	70	176	61	2920	66
Lander	189	64	220	75	221	60	316	79	321	71	333	73	395	85	374	87	320	85	274	80	226	77	233	83	3422	77
Sheridan	140	49	168	58	208	56	220	54	284	62	287	62	374	79	341	78	283	75	231	68	176	61	174	63	2886	65
ALASKA																										
Anchorage	111	55	165	65	209	47	373	84	330	61	338	59	277	49	202	41	166	43	110	36	56	26	84	48	2421	53
Juneau	127	57	113	43	233	63	256	59	167	32	190	35	144	27	207	44	156	41	93	29	28	12	22	11	1736	38
Nome	76	45	159	66	156	43	291	64	373	64	349	55	254	41	73	14	160	41	119	40	63	33	69	53	2142	47
PUERTO RICO																										
San Juan	243	70	218	67	289	77	305	81	279	69	283	71	338	83	298	75	235	64	251	69	274	81	282	82	3295	74
PACIFIC AREA																										
Hilo T. H.	199	56	195	61	170	46	133	35	113	28	212	53	222	54	186	47	191	52	208	57	212	63	98	29	2139	48
Honolulu T. H.	231	68	209	65	243	65	243	64	256	63	268	67	273	66	304	76	288	78	272	75	238	71	212	63	3037	68
Lihue T. H.	160	47	110	34	147	39	202	53	141	34	167	41	179	43	177	44	206	56	203	56	168	51	130	39	1990	45

1. Changed from Brainard Field to Bradley Field beginning August 10, 1954.
2. Changed to East Lansing CO beginning August 1954.
3. March and April estimated.
4. Changed to airport beginning June 8, 1954.
5. Recorder inoperative August 10-17, 1954.

Table 10

ANNUAL CLIMATOLOGICAL DATA

YEAR 1954

State and Station	Temperature							Degree days	Precipitation						Relative humidity				Wind					Percent of possible sunshine	Average sky cover sunrise to sunset	Number of days										
	Averages			Extremes								Snow, Sleet, Hail									Fastest mile					Sunrise to sunset							Max. temp.		Min. temp	
	Daily maximum	Daily minimum	Monthly	Highest	Date	Lowest	Date		Total	Greatest in 24 hrs.	Date	Total	Greatest in 24 hrs.	Date	1:30a E.S.T.	7:30a E.S.T.	1:30p E.S.T.	7:30p E.S.T.	Average hourly speed	Prevailing direction	Speed	Direction	Date			Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Sleet, Hail 1.0 or more	Thunderstorms	Heavy fog	90° and above	32° and below	32° and below	Zero and below
ALABAMA																																				
Birmingham	76.1	51.7	63.9	103	Jul. 1	21	Nov. 3+	2721	40.66	3.19	Jan. 15-16	T	T	Dec. 18-19+	76	80	48	56	6.2	S	48	SW	Feb. 28	68	5.1	134	111	120	97	0	59	1	107	1	67	0
Mobile	79.1	57.2	68.2	102	Aug. 30+	25	Dec. 20	1611	42.35	2.89	July 16	1.6	1.6	Mar. 6	84	85	53	72	10.4	N	--	--	---	--	4.8	139	142	84	95	1	80	27	114	0	12	0
Montgomery	78.7	54.2	66.5	105	Jun. 28	23	Nov. 3	2159	26.82	3.01	Dec. 31-Jan. 1	T	T	Jul. 16+	78	85	48	58	7.6	NE	51	E	Jul. 14	72	4.9	135	127	103	76	0	64	9	121	0	34	0
ARIZONA																																				
Flagstaff	62.4	30.3	46.4	94	Jun. 22	-5	Jan. 14	6796	19.55	1.36	Mar. 22-23	84.3	15.7	Feb. 14-15	--	75	38	--	----	---	---	---	---	--	4.0	190	88	87	64	14	48	3	2	7	201	7
Phoenix	86.1	58.1	72.1	112	Jul. 28	24	Dec. 28	1108	4.31	.81	Mar. 22	.0	.0	----	46	57	33	27	5.3	E	*45	SSE	May 20	93	3.2	234	62	69	31	0	21	2	179	0	10	0
Prescott	72.2	41.3	56.8	102	Jun. 22	10	Dec. 28	3834	13.52	1.91	Aug. 3-4	17.2	4.4	Mar. 24-25	--	57	30	26	7.1	SW	72	SW	Nov. 29	82	3.7	199	93	73	57	7	55	7	38	1	129	0
Tucson	84.9	56.2	70.6	108	Jul. 28+	18	Dec. 28	1137	11.63	1.29	Sep. 1-2	T	T	Mar. 24	35	44	23	21	6.9	SE	44	S	Jul. 10	89	3.6	212	71	82	48	0	48	1	166	0	12	0
Winslow	73.0	41.1	57.1	103	Jun. 22	-5	Jan. 1	4093	6.95	.78	Jul. 21-22	6.3	2.9	Jan. 13	45	57	30	25	8.3	WSW	*59	SSE	Jul. 16	--	3.6	204	90	71	43	2	42	2	69	2	131	1
Yuma	90.5	60.3	75.4	117	Aug. 29	28	Dec. 29	663	.61	.24	Mar. 21-22	.0	.0	----	36	45	25	19	8.9	N	54	S	Aug. 1	92	2.5	259	65	41	11	0	7	0	200	0	4	0
ARKANSAS																																				
Fort Smith	76.4	50.9	63.7	111	Jul. 14+	5	Jan. 11	3078	30.57	2.45	Dec. 27	6.3	3.5	Jan. 10	72	80	49	51	7.9	NE	42	NE	Aug. 28	67	4.6	165	96	104	75	2	54	1	113	5	70	0
Little Rock	76.1	53.5	64.8	107	Jul. 15	17	Jan. 11	2737	37.82	3.94	May 1-2	4.0	3.0	Jan. 10	69	76	49	52	8.8	SSW	48	SE	Apr. 30	67	5.1	136	102	127	83	1	45	8	115	2	43	0
Texarkana	77.9	54.9	66.4	106	Aug. 30	19	Jan. 22	2227	36.29	2.33	May 11-12	.6	.4	Jan. 21	--	--	--	--	---	---	---	---	---	--	---	---	---	---	73	0	57	6	113	1	33	0
CALIFORNIA																																				
Bakersfield	77.5	51.2	64.4	109	Jun. 23+	26	Dec. 29+	2148	4.48	1.09	Jan. 19-20	.0	.0	----	59	70	48	39	5.2	NW	*30	SE	Mar. 16	--	3.6	207	67	91	27	0	1	34	104	0	11	0
Bishop	76.7	36.6	56.7	109	Jun. 22	9	Dec. 28	3913	7.19	2.08	Feb. 13	T	T	Dec. 30+	--	--	24	19	----	---	---	---	---	--	3.2	218	77	70	22	0	9	0	107	0	157	0
Blue Canyon	59.3	42.5	50.9	87	Jun. 21+	13	Mar. 11	5363	67.63	4.33	Mar. 8-9	240.3	27.7	Jan. 16-17	--	--	44	49	----	---	---	---	---	--	4.4	188	62	115	77	35	5	62	0	13	88	0
Burbank	76.2	51.7	64.0	104	Jul. 7	31	Dec. 29	1463	13.59	2.58	Feb. 13-14	T	T	Mar. 16+	71	77	51	46	4.8	S	*34	SSE	Mar. 16	--	4.2	178	98	89	37	0	1	36	43	0	1	0
Eureka CO	57.4	46.6	52.0	76	Sep. 25	30	Dec. 27+	4644	42.70	3.03	Dec. 30-31	T	T	Dec. 6+	--	--	--	--	6.9	†NW	39	SW	Feb. 12	44	7.2	61	92	212	116	0	3	26	0	0	4	0
Fresno	74.9	48.4	61.7	108	Jun. 22	25	Dec. 27	2621	9.83	1.16	Jan. 23-24	T	T	Mar. 24+	67	80	55	41	5.5	NW	35	SW	Feb. 14	81	3.9	197	73	95	33	0	1	54	91	0	18	0
Los Angeles CO	74.4	55.4	64.9	96	Jul. 7	36	Dec. 28	1132	13.69	2.88	Feb. 13-14	.3	.3	Jan. 12	73	75	48	54	5.7	†W	37	NW	Mar. 11	74	4.1	168	117	80	35	0	5	31	23	0	0	0
Los Angeles	70.3	54.5	62.4	91	Feb. 7	37	Dec. 29+	1477	12.91	3.28	Feb. 13	T	T	Mar. 17+	80	81	60	66	6.3	W	‡45	W	Apr. 30+	--	5.0	130	123	112	35	0	2	57	3	0	0	0
Mount Shasta CO	61.8	36.4	49.1	94	Aug. 1+	6	Jan. 25	5876	42.56	3.59	Feb. 11-12	137.5	22.7	Jan. 27	71	75	56	48	----	---	---	---	----	--	4.9	155	77	133	88	24	6	8	15	2	13[illegible]	0
Oakland	65.6	48.5	57.1	96	Jul. 28	31	Dec. 26	2944	15.53	1.42	Jan. 16-17	T	T	Mar. 21+	79	85	68	61	6.8	W	*38	S	Feb. 17	--	4.8	147	109	109	58	0	1	12	6	0	2	0
Red Bluff	74.0	49.8	61.9	109	Jun. 21	27	Dec. 27	2664	26.56	4.00	Nov. 8-9	T	T	Mar. 19+	59	69	49	40	8.9	SSE	50	SE	Jan. 17	75	4.5	173	72	120	83	0	9	27	82	0	14	0
Sacramento CO	72.1	48.8	60.5	107	Jul. 28	29	Jan. 25	2632	20.99	2.10	Jan. 16-17	T	T	Mar. 19	AP 74	AP 83	AP 60	AP 47	AP 8.7	AP SE	AP 60	AP SE	Jan. 17	AP 71	AP 4.1	AP 193	AP 64	AP 108	52	AP 0	AP 2	AP 47	59	0	6	0
Sandberg CO	65.7	46.8	56.3	96	Aug. 31+	19	Dec. 27	3929	10.90	2.37	Jan. 12-13	30.0	12.5	Jan. 12-13	--	--	38	40	----	---	---	---	---	--	3.0	233	67	65	28	6	1	63	16	0	47	0
San Diego	70.8	56.0	63.4	88	Aug. 30+	38	Dec. 28	1159	9.52	1.80	Mar. 21-22	T	T	Mar. 17	78	79	60	62	6.0	WNW	36	W	Mar. 16	63	4.8	147	124	94	31	0	2	42	0	0	0	0
San Francisco CO	62.2	50.4	56.3	93	Sep. 25	37	Dec. 23	3152	19.85	1.81	Dec. 1-2	T	T	Mar. 20+	--	--	69[b]	--	9.0	†W	35	SW	Feb. 17	70	4.8	155	99	111	68	0	1	1	2	0	0	0
San Francisco	64.4	46.7	55.6	91	Sep. 24	31	Nov. 30+	3413	17.33	1.68	Dec. 1-2	T	T	Mar. 20+	86	91	71	68	11.5	WNW	48	S	Jan. 17	--	4.8	153	98	114	65	0	1	17	2	0	3	0
Santa Maria	68.9	45.3	57.1	90	Sep. 23	28	Dec. 27	2835	11.03	1.39	Mar. 16-17	.0	.0	----	85	86	58	60	7.0	W	32	SE	Mar. 16	--	4.0	187	101	77	39	0	0	88	1	0	7	0
COLORADO																																				
Alamosa	62.6	25.8	44.2	91	Jun. 24	-28	Dec. 28	7583	5.56	.72	Jul. 4	8.9	3.4	Jan. 20-21	--	72	37	38	---	---	---	---	---	--	4.1	158	149	58	59	4	38	14	5	19	209	33
Colorado Springs	66.3	37.1	51.7	100	Jul. 13+	-1	Mar. 3+	5441	15.43	3.09	Jun. 29-30	18.8	5.3	Apr. 30-May 1	54	58	32	35	11.5	NNW	*60	WNW	Mar. 18	--	4.2	171	119	75	72	6	52	21	25	13	151	2
Denver	67.9	39.1	53.5	102	Jul. 11+	-5	Mar. 3	5036	7.51	1.15	Jul. 14	32.7	8.6	Dec. 26-27	51	57	29	32	10.9	S	45	NW	Mar. 18+	74	5.0	127	132	106	62	10	38	6	43	14	141	2
Grand Junction	66.9	41.6	54.3	102	Jun. 23	5	Dec. 30	5032	9.32	.78	Nov. 12-13	17.3	8.4	Nov. 29-30	50	58	39	35	8.5	ESE	65	S	Mar. 23	72	4.6	150	119	96	66	5	50	6	53	12	134	0

See reference notes at end of table.

ANNUAL CLIMATOLOGICAL DATA

State and Station	Temperature: Averages: Daily maximum	Temperature: Averages: Daily minimum	Temperature: Averages: Monthly	Temperature: Extremes: Highest	Temperature: Extremes: Date	Temperature: Extremes: Lowest	Temperature: Extremes: Date	Degree days	Precipitation: Total	Precipitation: Greatest in 24 hrs.	Precipitation: Date	Snow, Sleet, Hail: Total	Snow, Sleet, Hail: Greatest in 24 hrs.	Snow, Sleet, Hail: Date	Relative humidity: 1:30a E.S.T.	Relative humidity: 7:30a E.S.T.	Relative humidity: 1:30p E.S.T.	Relative humidity: 7:30p E.S.T.	Wind: Average hourly speed	Wind: Prevailing direction	Wind: Fastest mile: Speed	Wind: Fastest mile: Direction	Wind: Fastest mile: Date	Percent of possible sunshine	Average sky cover sunrise to sunset	Number of days: Sunrise to sunset: Clear	Number of days: Sunrise to sunset: Partly cloudy	Number of days: Sunrise to sunset: Cloudy	Number of days: Precipitation .01 inch or more	Number of days: Snow, Sleet, Hail 1.0 or more	Number of days: Thunderstorms	Number of days: Heavy fog	Number of days: Max. temp: 90° and above	Number of days: Max. temp: 32° and below	Number of days: Min. temp: 32° and below	Number of days: Min. temp: Zero and below
COLORADO (Cont'd.)																																				
Pueblo	71.7	39.6	55.7	105	Jun. 23	-8	Mar. 3	4606	7.51	1.26	Apr.30 - May 1	20.0	5.6	Apr.30 - May 1	54	65	35	34	8.4	W	63	W	Mar. 18	78	4.4	157	123	85	57	8	47	3	80	8	147	[illegible]
CONNECTICUT																																				
Bridgeport	60.4	44.0	52.2	94	Jul. 30	-1	Jan. 18	5265	39.28	4.07	Nov. 2-3	12.7	3.5	Jan. 10-11	--	75	58	69	----	---	---	---	---	--	6.0	101	112	152	109	5	25	25	4	16	98	1
Hartford %	60.4	40.6	50.5	97	Jul. 14	-11	Jan. 18	5756	40.17	3.23	Sept. 10-11	21.3	5.2	Jan. 10-11	81	78	56	69	9.0	S	56	NE	Aug. 31	54	6.7	75	106	184	143	7	27	20	8	24	132	4
New Haven	59.0	42.3	50.7	91	Jul. 31	-1	Jan. 14	5625	45.48	5.55	Sept. 10-11	22.4	6.5	Jan. 10-11	--	79	61	--	7.5	---	47	SE	Oct. 15	58	6.4	87	111	167	136	7	31	25	1	20	115	1
DELAWARE																																				
Wilmington	64.8	44.8	54.8	102	Jul. 31	2	Jan. 18	4741	33.72	2.05	Aug. 20-21	13.3	6.6	Jan. 10-11	79	78	53	67	8.7	NW	58	SSW	Oct. 15	--	5.8	118	100	147	117	4	32	46	29	15	105	0
DIST. OF COLUMBIA																																				
Washington CO	67.4	48.7	58.1	104	Jul. 31	12	Jan. 23	4051	31.28	1.96	May 3-4	12.8	6.9	Jan. 22	AP 73	AP 74	AP 49	AP 59	7.5	AP SSW	42	SE	Oct. 15	AP 61	AP 5.5	AP 119	AP 112	AP 134	113	3	30	AP 11	38	11	70	0
Washington	66.9	48.4	57.7	103	Jul. 31	13	Jan. 23	4118	28.28	1.73	Oct. 15	11.4	6.4	Jan. 22	73	74	49	59	10.1	SSW	78	SE	Oct. 15	61	5.5	119	112	134	110	4	31	11	32	11	81	0
FLORIDA																																				
Apalachicola CO	75.6	61.6	68.6	94	Aug. 29+	31	Dec. 20	1291	38.64	5.01	Jun. 11-12	.0	.0	----	85	86	66	75	7.9	---	36	NE	Aug. 21+	69	4.2	176	103	86	90	0	72	26	35	0	3	0
Daytona Beach	80.1	60.1	70.1	99	Jun. 28	27	Dec. 21	955	33.96	2.85	Oct. 7-8	.0	.0	----	88	88	60	78	10.2	ENE	40	NNW	Dec. 6+	--	5.2	123	138	104	104	0	62	37	68	0	5	0
Fort Myers	83.5	62.7	73.1	96	Aug. 5	37	Dec. 22	427	49.73	2.90	Aug.31- Sept.1	.0	.0	----	91	90	57	79	7.9	E	33	N	Feb. 24	--	5.0	130	146	89	125	0	111	19	99	0	0	0
Jacksonville CO	79.3	60.9	70.1	101	Jun. 28	29	Dec. 7	1135	31.76	4.53	Oct. 7-8	AP T	AP T	Mar. 6	AP 83	AP 85	AP 51	AP 68	AP 9.2	AP WSW	AP 46	AP S	Sept. 11	AP 60	AP 5.0	AP 123	AP 147	AP 95	104	0	AP 42	AP 22	85	0	4	0
Key West CO	83.6	71.0	77.3	95	Aug. 10	49	Dec. 23	43	56.85	19.88	Nov. 13-14	.0	.0	----	--	83	68	77	7.6	NE	38	NW	Feb. 8	71	5.3	109	156	100	107	0	65	0	91	0	0	0
Lakeland CO	81.1	62.5	71.8	97	Aug. 18	34	Dec. 20+	640	36.30	2.72	Jun. 3-4	.0	.0	----	--	--	--	--	6.4	NE	--	---	---	58	5.3	102	162	101	123	0	96	20	71	0	0	0
Miami Beach	81.3	71.0	76.2	96	Aug. 27	44	Dec. 21	87	50.59	5.90	May 13	.0	.0	----	--	--	--	--	---	---	--	---	---	--	---	124	89	152	131	0	--	--	27	0	0	0
Miami CO	80.4	68.6	74.5	94	Aug. 27	40	Dec. 21	170	55.64	3.75	May 26-27	.0	.0	----	AP 82	AP 83	AP 59	AP 72	11.4	S	48	S	Jul. 15	73	5.0	118	175	72	126	0	76	1	15	0	0	0
Orlando	81.7	61.1	71.4	97	Jun. 27+	30	Dec. 21	759	47.97	3.30	Oct. 8-9	.0	.0	----	90	89	57	74	9.0	N	45	ESE	Jul. 1	--	5.0	121	150	94	116	0	66	15	95	0	2	0
Pensacola CO	76.4	60.5	68.5	99	Aug. 31+	29	Feb. 8	1427	28.66	1.98	Jul. 24-25	2.1	2.1	Mar. 6	AP 82	AP 84	AP 56	AP 72	AP 9.5	AP NW	32	SE	Dec. 28	72	---	---	---	---	81	1	38	--	66	0	5	0
Tallahassee	79.8	56.7	68.3	100	Jun. 28	24	Dec. 21+	1569	30.98	2.62	Jul. 25-26	T	T	Jun. 10	84	86	50	68	5.3	NNW	--	---	---	--	5.0	121	148	96	101	0	71	41	103	0	23	0
Tampa	81.0	62.1	71.6	94	Aug. 20+	35	Dec. 20+	689	43.20	3.56	Nov. 13-14	T	T	Aug. 14	88	87	57	76	8.5	E	50	NW	Feb. 24	74	5.0	119	150	96	127	0	98	22	62	0	0	0
West Palm Beach	82.8	66.3	74.6	97	Jun. 11	38	Dec. 22+	263	73.21	4.87	Jun. 18-19	T	T	Jun. 14+	85	84	61	76	10.6	ESE	50	E	Oct. 1+	--	5.7	99	141	125	158	0	90	5	74	0	0	0
GEORGIA																																				
Athens	74.6	51.1	62.9	105	Aug. 17	19	Nov. 3	2867	28.61	2.02	Jan. 16	T	T	Dec. 20+	--	--	--	--	----	---	---	---	----	--	4.6	147	123	95	87	0	51	--	94	0	51	0
Atlanta	73.6	52.3	63.0	102	Aug. 16	21	Jan. 13	2839	31.80	2.77	Jul. 14	.1	.1	Dec. 19	75	79	50	60	9.3	NW	56	SE	Jul. 2	64	5.2	129	122	114	88	0	49	14	82	0	45	0
Augusta	77.4	50.9	64.2	103	Aug. 17+	18	Dec. 8	2479	31.53	2.81	Jul. 8	T	T	Jul. 8+	84	85	48	66	6.3	W	42	NW	Aug. 28	--	5.1	142	102	121	83	0	45	22	107	0	61	0
Columbus	77.4	52.4	64.9	103	Jun. 28	22	Dec. 21+	2364	30.23	1.78	Mar. 13	.0	.0	----	--	85	49	62	---	---	---	---	----	--	4.8	149	105	111	83	0	60	9	111	0	49	0
Macon	78.9	54.0	66.5	106	Jun. 28	22	Nov. 3	2133	26.05	1.63	Apr. 29	T	T	Dec. 19+	75	80	43	54	7.6	WNW	60	S	Mar. 13	74	4.9	152	112	101	81	0	55	10	116	0	34	0
Rome	74.4	47.6	61.0	104	Jul. 14	18	Jan. 13	3343	44.01	4.15	Jan. 15-16	.5	.5	Jan. 11	--	84	47	65	---	---	---	---	----	--	5.2	125	116	124	96	0	67	10	102	0	94	0
Savannah	78.2	54.4	66.3	104	Aug. 5	22	Dec. 8	1913	32.83	5.87	Sept. 15-16	T	T	Apr. 14+	83	84	50	69	8.8	NE	58	N	Aug. 17	69	5.0	136	133	96	84	0	46	34	93	0	35	0
IDAHO																																				
Boise	63.7	38.9	51.3	100	Jul. 4	7	Dec. 27	5542	8.16	.67	May 31	6.7	2.2	Dec. 29	59	67	47	41	9.8	SE	56	W	Feb. 17	73	5.0	146	98	121	67	2	12	10	45	9	131	0
Idaho Falls 46 W, CO	59.1	27.2	43.2	99	Aug. 2+	-17	Dec. 27	8137	7.40	1.73	Jun. 9-10	18.6	5.4	Feb. 12-13	--	--	--	--	9.1	WSW	d 44	WSW	Oct. 11	--	---	---	---	---	54	5	6	--	32	38	218	26
Idaho Falls 43 NW,CO	59.2	27.7	43.5	100	Jul. 13+	-23	Dec. 27	8080	6.86	.70	Feb. 13	13.6	7.0	Feb. 13	--	--	--	--	7.4	SSW	d 41	SSW	Jan. 15+	--	---	---	---	---	55	2	---	---	32	41	213	21
Lewiston	62.3	39.0	50.7	99	Jul. 6	-10	Jan. 20	5523	10.24	.86	Mar. 20-21	7.5	2.7	Jan. 13	--	74	57	46	----	---	---	---	---	--	6.5	86	89	190	90	3	15	14	22	7	115	2
Pocatello	61.1	34.4	47.8	100	Aug. 2	-15	Dec. 28	6713	8.57	.79	May 21	26.0	4.5	Jan. 24	56	67	46	40	11.3	SW	54	W	Oct. 11	65	5.6	122	101	142	71	13	23	16	33	28	170	8

See reference notes at end of table.

Table 10—Continued

ANNUAL CLIMATOLOGICAL DATA

YEAR 1954

State and Station	Temperature							Degree days	Precipitation						Relative humidity				Wind					Percent of possible sunshine	Average sky cover sunrise to sunset	Number of days										
	Averages			Extremes								Snow, Sleet, Hail									Fastest mile					Sunrise to sunset							Max temp.		Min. temp.	
	Daily maximum	Daily minimum	Monthly	Highest	Date	Lowest	Date		Total	Greatest in 24 hrs.	Date	Total	Greatest in 24 hrs.	Date	1.30a E.S.T.	7:30a E.S.T.	1:30p E.S.T.	7:30p E.S.T.	Average hourly speed	Prevailing direction	Speed	Direction	Date			Clear	Partly cloudy	Cloudy	Precipitation 01 inch or more	Snow, Sleet, Hail 1.0 or more	Thunderstorms	Heavy fog	90° and above	32° and below	32° and below	Zero and below
ILLINOIS																																				
Cairo CO	70.9	51.9	61.4	104	Jul. 14+	11	Jan. 12	3543	43.64	2.63	Sept. 20	4.0	3.9	Jan. 9-10	--	80	56	--	8.5	SW	44	NW	Aug. 5	62	5.6	115	119	131	106	2	50	2	88	7	57	0
Chicago	61.6	44.2	52.9	100	Jun. 25	-7	Jan. 17	5541	45.92	5.63	Oct. 9-10	44.2	11.8	Mar. 2-3	72	75	55	62	10.3	NW	51	W	Mar. 25	55	6.5	76	112	177	125	10	47	8	36	24	111	2
Moline	61.4	41.3	51.4	98	Jul. 12+	-8	Jan. 17	6003	38.86	4.89	Oct. 9-10	28.4	8.4	Dec. 29	79	83	60	65	9.2	NW	66	SW	Mar. 25	55	6.2	92	108	165	104	8	57	19	32	33	138	3
Peoria	62.6	43.6	53.1	100	Jul. 18	-4	Jan. 17	5532	41.96	3.26	Aug. 25-26	19.4	5.1	Dec. 29	--	82	60	64	10.9	NW	55	SW	May 31	60	6.2	92	111	162	106	5	58	9	40	26	124	2
Springfield	65.3	44.7	55.0	112	Jul. 14	1	Jan. 12	5129	26.67	1.28	Jun. 8	6.5	2.0	Mar. 2	77	82	56	62	12.7	S	50	W	Aug. 18	60	6.1	98	100	167	107	5	59	9	51	16	117	0
INDIANA																																				
Evansville	69.0	47.0	58.0	105	Jul. 14	3	Jan. 12	4277	33.83	2.85	Sept. 19-20	8.3	3.3	Jan. 9-10	80	82	55	62	9.1	SSW	54	N	Dec. 5+	62	5.8	114	93	158	116	4	48	5	78	9	94	0
Fort Wayne	61.7	41.7	51.7	103	Jul. 14	3	Jan. 13	5747	41.94	2.43	Aug. 18-19	23.7	4.2	Feb. 4	82	84	59	68	11.8	SW	61	NW	Jul. 20	52	6.7	74	104	187	133	4	54	15	30	25	138	0
Indianapolis	64.4	44.0	54.2	104	Jul. 14	1	Jan. 12	5189	27.93	1.44	Jan. 26-27	16.1	3.6	Jan. 4-5	78	81	56	64	11.6	SW	56	NW	Mar. 3	60	6.3	90	103	172	127	5	62	14	50	20	121	0
South Bend	59.7	40.8	50.3	97	Sept. 6	-2	Jan. 17	6104	46.71	3.18	Oct. 9-10	77.4	12.5	Dec. 18-19	82	84	62	71	10.5	SSW	*47	SW	Mar. 25	--	6.9	67	97	201	150	21	50	17	16	29	144	2
IOWA																																				
Burlington	63.0	42.4	52.7	101	Jul. 14	-7	Jan. 17	5703	36.04	2.77	May 31-Jun. 1	13.0	4.2	Dec. 29	77	81	58	64	10.6	SSW	56	W	Apr. 26	69	6.0	100	112	153	105	3	65	8	40	29	132	3
Davenport L & D #15	61.1	43.5	52.3	97	Jul. 12+	-8	Jan. 17	5784	41.01	4.55	Oct. 9-10	26.6	8.0	Dec. 29	--	--	--	--	----	---	--	--	----	--	---	---	---	---	106	8	54	11	31	33	124	2
Des Moines	61.9	41.5	51.7	103	Jul. 13+	-14	Jan. 21	6024	36.21	3.04	Aug. 25-26	15.2	3.7	Mar. 29	76	81	58	61	13.3	NW	65	SE	Jun. 12	60	6.2	86	130	149	104	6	57	8	41	35	134	8
Dubuque	57.6	38.5	48.1	94	Jul. 12+	-15	Jan. 17	6813	38.21	3.51	Jun. 15-16	28.2	5.7	Mar. 29	--	83	61	69	----	---	--	--	----	--	6.6	78	103	184	112	12	52	20	11	58	154	7
Sioux City	61.0	39.9	50.5	105	Jul. 11	-17	Jan. 21	6372	24.68	3.57	Jun. 20	25.3	5.8	Mar. 28-29	74	80	58	58	11.9	NNW	59	NW	Nov. 24	62	6.1	91	121	153	90	10	48	21	34	34	138	12
KANSAS																																				
Concordia CO	68.4	45.7	57.1	111	Jul. 12+	-8	Jan. 21	4759	22.39	1.85	Aug. 6-7	2.8	.9	Jan. 13	62	71	45	48	8.6	†S	35	NW	May 31	67	4.5	159	108	98	74	0	66	5	76	18	110	3
Dodge City	71.0	44.8	57.9	107	Jul. 11	-1	Jan. 21	4460	12.01	1.38	Aug. 20-21	5.3	2.4	Feb. 19	63	72	44	44	15.8	S	68	N	Feb. 19	76	4.3	165	109	91	56	3	50	13	93	9	118	1
Goodland	68.3	38.1	53.2	108	Jul. 11	-7	Dec. 29	5583	11.12	.98	Jun. 12-13	22.8	7.1	Mar. 18	66	73	41	44	11.3	S	*47	NW	Mar. 12	--	4.6	156	113	96	52	5	46	15	82	22	166	5
Topeka CO	69.8	47.3	58.6	112	Jul. 18+	-6	Jan. 21	4422	28.21	2.40	Jul. 1-2	AP 2.2	AP .9	Dec. 27+	AP 70	AP 76	AP 49	AP 51	AP 10.9	AP S	AP 63	AP NE	Oct. 11	AP 60	AP 5.4	AP 135	AP 90	AP 140	73	AP 0	AP 60	AP 10	84	13	102	1
Wichita	72.3	47.8	60.1	113	Jul. 14	-1	Jan. 21	4129	14.53	1.88	May 23	1.0	.6	Jan. 21	64	73	45	46	13.9	S	47	N	Jan. 20	78	4.8	149	106	110	46	0	42	11	101	10	101	1
KENTUCKY																																				
Lexington	67.6	46.5	57.1	103	Jul. 14	-3	Jan. 12	4455	35.53	3.26	Sept. 20-21	10.4	4.4	Jan. 10	77	81	53	63	12.0	SSE	--	--	----	--	6.0	91	124	150	118	4	51	8	55	13	93	2
Louisville	69.1	47.6	58.4	105	Jul. 14	2	Jan. 13+	4189	32.94	4.22	Sept. 19-20	5.4	4.9	Jan. 10	77	81	53	60	8.4	S	57	NW	Sept. 19+	62	5.8	110	105	150	115	1	43	5	81	9	81	0
LOUISIANA																																				
Baton Rouge	79.8	57.3	68.6	103	Jun. 30	26	Dec. 14+	1452	41.67	4.96	May 2-3	T	T	Mar. 5	84	88	53	64	8.3	E	--	---	----	--	5.1	128	130	107	98	0	69	32	111	0	16	0
Lake Charles	79.4	59.2	69.3	99	Aug. 30+	30	Feb. 8+	1252	30.08	3.06	Nov. 3-4	T	T	Mar. 5+	84	87	54	65	8.3	S	*46	E	Dec. 12	--	5.4	106	142	117	73	0	54	44	98	0	6	0
New Orleans CO	78.8	62.7	70.8	102	Jun. 30	33	Feb. 8	1040	49.91	4.62	Sept. 16	T	T	May 28	79	83	58	65	6.5	---	30	NE	Aug. 15	66	5.2	121	134	110	101	0	61	16	96	0	0	0
Shreveport	79.3	56.3	67.8	106	Jul. 24	19	Jan. 22	1889	34.94	2.85	Nov. 3-4	T	T	Dec. 28+	75	85	54	56	9.8	S	--	--	----	73	4.9	152	97	116	71	0	49	12	118	1	23	0
MAINE																																				
Caribou	47.0	30.1	38.6	86	Jun. 22	-26	Jan. 23	9606	51.11	6.23	Sept. 11-12	127.8	14.3	Dec. 28-29	83	80	66	76	10.6	NW	50	SW	Jun. 22	--	7.5	54	80	231	183	35	23	28	0	95	183	32
Portland	54.8	34.9	44.9	91	Jun. 22+	-19	Feb. 1+	7427	55.26	7.49	Sept. 11	66.0	8.0	Mar. 14-15+	87	82	64	79	9.3	N	69	E	Aug. 31	54	6.7	76	105	184	154	18	16	45	2	38	158	13
MARYLAND																																				
Baltimore CO	66.8	50.6	58.7	102	Jul. 31	16	Jan. 23	3891	30.46	1.42	Mar. 1	AP 16.6	AP 5.8	Jan. 10-11	AP 76	AP 76	AP 51	AP 62	AP 9.6	AP WNW	AP 73	AP SE	Oct. 15	AP 61	AP 5.5	AP 124	AP 110	AP 131	AP 117	AP 6	AP 35	AP 32	26	9	59	0
Frederick	64.9	42.7	53.8	102	Jul. 31	5	Jan. 18	5017	31.10	1.88	May 2-3	16.8	4.0	Jan. 10-11	--	--	58	--	---	---	--	--	----	--	---	---	---	---	128	8	11	7	30	14	123	0
MASSACHUSETTS																																				
Blue Hill Obs.	57.3	40.3	48.0	93	Jul. 14	-6	Feb. 13	6481	57.38	5.23	Sept. 11	54.4	11.4	Dec. 21	82	79	60	72	15.0	WNW	93	SE	Aug. 31	49	6.2	92	114	159	159	14	28	98	2	35	124	4
Boston	59.1	43.7	51.4	95	Jul. 31+	-1	Feb. 13	5508	62.32	5.74	May 15-16	33.9	6.0	Dec. 21	75	73	58	67	13.0	SW	86	SE	Aug. 31	60	6.5	90	106	169	159	9	23	23	10	23	91	1

See reference notes at end of table.

ANNUAL CLIMATOLOGICAL DATA

State and Station	Temperature								Precipitation						Relative humidity				Wind							Number of days										
	Averages			Extremes								Snow, Sleet, Hail									Fastest mile					Sunrise to sunset							Max. temp.		Min. temp	
	Daily maximum	Daily minimum	Monthly	Highest	Date	Lowest	Date	Degree days	Total	Greatest in 24 hrs.	Date	Total	Greatest in 24 hrs.	Date	1:30a E.S.T.	7:30a E.S.T.	1:30p E.S.T.	7:30p E.S.T.	Average hourly speed	Prevailing direction	Speed	Direction	Date	Percent of possible sunshine	Average sky cover sunrise to sunset	Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Sleet, Hail 1.0 or more	Thunderstorms	Heavy fog	90° and above	32° and below	32° and below	Zero and below
MASSACHUSETTS (Cont'd.)																																				
Nantucket	56.0	43.3	49.7	81	Jun. 27	2	Feb. 13	5673	41.33	1.95	May 15-16	31.9	9.1	Dec. 22+	86	81	73	84	13.3	WSW	73	SE	Sept. 11	58	6.7	73	104	188	139	5	27	82	0	11	99	0
Pittsfield	54.7	35.5	45.1	92	Jul. 14	-17	Jan. 18	7354	47.50	2.34	Sept. 10-11	58.9	8.0	Feb. 3-4	--	--	--	--	----	---	--	--	----	--	---	--	---	---	173	20	---	---	2	53	165	11
MICHIGAN																																				
Alpena	51.6	36.6	44.1	90	Jul. 12+	-3	Feb. 12	7730	34.46	2.25	May 28-29	73.3	5.6	Dec. 9	--	78	64	70	10.4	---	50	SE	Mar. 25	52	6.8	64	114	187	163	25	44	31	2	62	146	4
Detroit	58.7	41.7	50.2	99	Sept. 5	6	Feb. 12+	6085	33.49	3.72	Oct. 3-4	39.3	6.5	Feb.28- Mar.1	78	78	59	66	10.4	N	56	W	Mar. 25	54	6.7	70	108	187	150	12	44	5	17	33	126	0
Detroit (Willow Run)	59.3	40.8	50.1	100	Sept. 5	3	Jan. 13	6122	33.50	2.98	Oct. 3-4	42.3	6.1	Mar. 29	80	82	57	67	10.5	SW	*40	NW	Jun. 12+	--	6.8	64	115	186	135	12	44	25	20	30	135	0
East Lansing CO	57.5	39.1	48.3	95	Sept. 5	-2	Jan. 28	6598	32.35	2.40	Feb. 15-16	52.6	7.5	Feb. 27-28	--	--	--	--	8.8	--	51	W	Jun. 25	--	---	--	---	---	147	18	41	17	11	41	147	3
Escanaba CO	50.3	35.9	43.1	91	Jul. 12	-16	Jan. 17	8073	31.77	2.09	Sept. 20-21	49.4	8.1	Jan. 10-11	80	80	69	75	10.4	--	49	N	Mar. 20	52	6.8	72	105	188	138	13	36	18	1	73	156	11
Grand Rapids CO	58.0	41.9	50.0	98	Sept. 6	5	Jan. 17	6136	37.77	3.90	Oct. 3	79.2	9.2	Jan. 26-27	AP 83	AP 84	AP 61	AP 70	AP 9.5	AP W	AP 57	AP SW	Mar. 25	AP 44	AP 7.1	AP 63	AP 97	AP 205	149	23	53	11	10	32	123	0
Marquette CO	49.7	35.7	42.7	90	Jun. 24	-11	Jan. 17	8260	30.37	1.59	Sept. 9-10	77.2	8.1	Mar. 12-13	--	75	65	70	8.2	--	37	S	Nov. 13	49	7.6	51	80	234	173	23	27	13	1	81	154	7
Muskegon	56.3	39.8	48.1	95	Sept. 6	-1	Jan. 28	6587	39.17	3.21	Oct. 3	86.4	12.0	Jan. 26-27	--	80	64	71	----	--	--	--	----	--	6.9	79	83	203	146	31	55	13	6	32	142	1
Sault Ste. Marie	48.4	31.3	39.9	85	Aug. 24+	-16	Jan. 17+	9135	29.30	2.67	Apr. 26-27	60.4	4.2	Jan. 13-14	87	86	70	79	9.2	WNW	36	SW	Mar. 25+	42	7.2	67	84	214	153	21	28	52	0	39	182	21
MINNESOTA																																				
Duluth CO	48.1	30.4	39.3	88	Jul. 26+	-31	Jan. 17	9453	29.35	2.41	Apr.30- May 1	57.9	5.8	Jan. 25	AP 82	AP 85	AP 66	AP 69	AP 12.9	AP NW	AP 49	AP W	Apr. 17	AP 51	AP 7.0	AP 68	AP 92	AP 205	128	19	AP 31	AP 51	0	97	187	23
International Falls	47.4	25.7	36.6	91	Jul. 26	-41	Jan. 21	10441	20.02	1.11	Jul. 30-31	81.2	7.7	May 2-3	80	82	61	65	----	--	--	--	----	--	7.1	67	88	210	143	25	27	21	1	107	206	53
Minneapolis-St. Paul	55.0	37.6	46.3	95	Jul. 19	-25	Jan. 17	7488	23.68	2.53	Jun. 19-20	28.7	7.4	Mar. 12-13	76	80	60	62	11.6	SE	46	E	Mar. 12	50	6.2	95	102	168	112	8	41	8	12	70	151	16
Rochester	55.4	35.7	45.6	96	Jul. 19+	-25	Jan. 17	7618	30.38	2.45	Jun. 18-19	29.6	5.5	Mar. 12	74	77	55	61	9.8	NW	--	--	----	--	6.6	80	100	185	108	10	53	17	10	70	166	17
St. Cloud	52.2	32.3	42.3	92	Jul. 26	-33	Jan. 17	8611	32.20	3.24	May 30-31	28.5	7.0	Mar. 25	82	83	62	67	7.1	NW	52	WNW	Aug. 15	--	6.4	92	93	180	109	9	42	16	2	79	180	28
MISSISSIPPI																																				
Jackson	78.8	54.6	66.7	105	Aug. 14	22	Feb. 8	2121	37.70	4.63	Apr.30 May 1	T	T	Dec. 18+	77	84	49	57	7.7	S	56	NW	Dec. 5	69	4.8	143	126	96	90	0	60	5	125	0	34	0
Meridian	78.8	52.3	65.6	103	Aug. 16+	19	Nov. 3	2304	35.34	2.44	Apr. 15-16	.0	.0	----	84	88	49	59	----	--	--	--	----	--	4.4	166	111	88	82	0	50	5	121	0	54	0
Vicksburg CO	77.1	57.3	67.2	101	Jul. 24	25	Feb. 8	1860	34.50	3.84	May 2-3	T	T	Mar. 5+	--	--	--	--	8.6	--	42	NW	Apr. 16	66	5.1	132	119	114	88	0	53	8	105	0	17	0
MISSOURI																																				
Columbia	68.4	46.5	57.5	113	Jul. 14+	1	Jan. 17+	4584	31.89	2.33	Oct. 10-11	12.6	6.9	Dec. 29	69	76	51	54	10.1	SSE	56	NW	Aug. 29	69	5.5	114	119	132	98	4	65	6	78	14	97	0
Kansas City	69.1	49.0	59.1	112	Jul. 13	-3	Jan. 21	4290	27.52	1.71	Aug. 1	1.3	.8	Jan. 26	64	72	51	48	10.6	S	56	NW	May 18	64	5.4	126	99	140	78	0	54	3	76	14	88	1
St. Joseph	67.1	45.3	56.2	107	Jul. 13	-7	Jan. 21	4922	37.26	3.48	Oct. 3-4	3.8	1.8	Dec. 27	--	--	--	--	----	---	--	--	---	--	---	---	---	---	85	2	57	6	69	17	119	3
St. Louis CO	68.4	50.1	59.3	112	Jul. 14	5	Jan. 12	4148	30.00	4.18	Sept. 19-20	5.5	1.8	Mar. 2-3	AP 70	AP 75	AP 51	AP 56	11.6	†SW	65	SW	Mar. 25	64	5.6	114	114	137	109	3	63	4	72	12	77	0
Springfield	69.8	47.7	58.8	113	Jul. 14	5	Jan. 12	4229	37.99	2.78	Oct. 25-26	12.7	2.8	Mar. 2	73	79	54	59	13.1	SSE	59	W	Aug. 19	70	5.3	123	115	127	88	5	55	10	86	13	94	0
MONTANA																																				
Billings	59.8	35.8	47.8	101	Jul. 12+	-27	Jan. 20	6776	11.75	.86	Oct. 23-24	71.8	8.8	Jan. 15-16	59	66	50	45	11.8	WSW	60	NW	Apr. 14	65	5.8	100	129	136	83	24	28	14	29	34	149	15
Glasgow CO	56.1	31.1	43.6	103	Jul. 5	-49	Jan. 20	8232	16.24	1.42	Aug. 16-17	47.1	5.5	Apr. 27-28	70	76	52	50	----	---	--	--	---	--	6.5	91	82	192	92	16	36	12	25	54	185	32
Great Falls	55.4	34.6	45.0	97	Jul. 12+	-33	Jan. 20	7544	15.68	2.11	Jun. 1-2	53.3	6.1	Sep. 28	60	66	48	45	15.6	SW	72	W	Feb. 24	61	6.1	100	105	160	103	16	36	8	13	46	148	23
Havre CO	55.9	32.8	44.4	101	Jul. 20	-43	Jan. 20	7861	13.94	1.26	Sept. 15-16	44.8	7.4	Mar. 11-12	--	--	51	49	9.0	†SW	49	W	Feb. 25	50	6.4	99	91	175	102	20	36	3	20	56	164	29
Helena	55.8	31.0	43.4	97	Jul. 4	-36	Jan. 20	8066	10.48	.85	Oct. 22-23	55.1	9.3	Nov. 27	65	73	53	48	8.0	W	52	W	Feb. 24	66	6.1	84	128	153	81	15	48	8	17	46	187	22
Kalispell	53.4	31.9	42.7	91	Jul. 19+	-22	Jan. 20	8116	15.29	1.19	Jun.30- Jul.1	49.7	7.2	Jan. 16-17	--	--	58	--	----	---	--	--	----	--	7.0	73	87	205	131	13	29	--	2	43	177	8
Miles City	59.8	33.4	46.6	108	Jul. 5	-36	Jan. 20	7358	10.38	1.20	Jun. 1-2	22.9	3.2	Mar. 11-12	--	--	--	--	10.0	NW	--	--	----	--	5.8	109	115	141	82	12	37	5	40	42	179	22
Missoula	56.0	32.3	44.2	95	Jul. 6	-12	Jan. 20	7660	13.60	1.34	Sept. 15-16	32.5	11.2	Jan. 15-16	71	81	58	50	5.9	W	57	SW	May 24	57	6.8	76	90	199	119	7	29	27	14	32	181	7

See reference notes at end of table.

ANNUAL CLIMATOLOGICAL DATA

Table 10—Continued

YEAR 1954

State and Station	Temperature							Degree days	Precipitation						Relative humidity				Wind					Percent of possible sunshine	Average sky cover sunrise to sunset	Number of days										
	Averages			Extremes								Snow, Sleet, Hail									Fastest mile					Sunrise to sunset							Max temp.		Min. temp.	
	Daily maximum	Daily minimum	Monthly	Highest	Date	Lowest	Date		Total	Greatest in 24 hrs.	Date	Total	Greatest in 24 hrs.	Date	1:30a E.S.T.	7:30a E.S.T.	1:30p E.S.T.	7:30p E.S.T.	Average hourly speed	Prevailing direction	Speed	Direction	Date			Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Sleet, Hail 1.0 or more	Thunderstorms	Heavy fog	90° and above	32° and below	32° and below	Zero and below
NEBRASKA																																				
Grand Island	64.7	40.6	52.7	109	Jul. 11	-12	Jan. 21	5783	20.30	2.46	Aug. 6-7	10.6	5.4	Feb. 19-20	--	--	--	--	12.5	S	---	---	----	--	5.4	126	104	135	65	3	45	12	51	25	146	7
Lincoln CO	64.9	43.6	54.3	108	Jul. 13	-12	Jan. 21	5385	30.57	2.64	Aug. 22-23	5.3	1.5	Feb. 20	--	--	--	--	9.5	†N	51	NW	Apr. 20	68	5.5	111	124	130	95	1	63	7	48	22	119	7
Norfolk	62.2	38.9	50.6	113	Jul. 11	-17	Jan. 21	6376	19.56	2.58	Jun. 20	17.7	6.1	Feb. 19-20	--	81	55	59	----	---	---	---	----	--	5.7	109	111	145	79	7	62	7	44	31	150	12
North Platte	65.4	36.7	51.1	112	Jul. 11	-6	Dec. 29+	6119	10.46	.92	May 16-17	14.5	4.5	Mar. 12-13	76	82	50	52	12.2	SE	59	N	Feb. 19	64	5.5	116	116	133	67	3	44	18	48	22	177	6
Omaha	64.7	43.0	53.9	108	Jul. 13	-4	Jan. 21	5549	25.02	2.24	Feb. 19-20	8.3	2.3	Mar. 12-13	72	78	55	56	12.4	SSE	54	NW	Apr. 20	61	5.5	108	133	124	90	3	53	12	54	26	123	8
Scottsbluff	65.7	35.9	50.8	107	Jul. 11	-10	Dec. 1	5980	14.70	1.84	Jun. 25-26	31.6	8.1	Mar. 11-12	65	74	42	44	11.4	WNW	80	WNW	Jun. 25	--	5.3	127	109	129	66	10	46	8	47	17	173	5
Valentine CO	61.9	37.4	49.7	107	Jul. 13	-17	Jan. 20	6412	17.64	1.37	Jun. 1-2	27.6	10.1	Mar. 12	--	--	--	--	9.2	---	45	SE	Jun. 13+	71	5.7	112	111	142	91	5	51	---	33	28	160	17
NEVADA																																				
Elko	64.0	28.5	46.3	102	Jul. 13	-13	Jan. 26	7079	6.58	.82	Mar. 19-20	29.1	11.0	Mar. 19-20	57	69	42	35	6.1	SW	* 41	W	Apr. 8	--	4.9	152	86	127	45	8	5	3	39	17	226	9
Ely	62.8	29.1	46.0	99	Jun. 22	-9	Dec. 28	7095	7.89	.86	Mar. 29-30	51.4	10.6	Mar. 29-30	57	64	37	35	12.4	†S	57	E	Aug. 30	76	4.4	161	104	100	54	15	18	2	23	15	218	8
Las Vegas	81.5	53.0	67.3	115	Jun. 22	20	Dec. 28	2263	4.71	1.18	Jul. 25	.0	.0	-----	31	38	23	18	9.8	SW	*54	SW	Jun. 4	87	2.9	233	81	51	24	0	14	2	152	0	40	0
Reno	67.6	31.7	49.7	100	Jun. 22	7	Dec. 27	5777	6.94	.96	Mar. 29-30	29.0	5.8	Mar. 23	58	73	38	29	6.4	WNW	66	SW	Feb. 12+	80	3.8	194	82	89	35	10	4	4	40	0	188	0
Winnemucca	67.1	30.0	48.6	104	Jun. 22	-13	Dec. 27	6343	3.13	.31	Dec. 30-31	9.7	2.0	Mar. 10-11	49	61	37	29	8.3	†W	47	W	Oct. 12+	77	4.7	156	92	117	39	4	2	1	53	5	210	8
NEW HAMPSHIRE																																				
Concord	57.0	34.7	45.9	95	Jun. 22	-16	Jan. 14	7145	46.58	3.56	Aug. 31	44.5	7.2	Dec. 21	82	80	57	71	6.5	NW	56	E	Aug. 31	46	6.6	79	97	189	149	12	23	46	5	39	161	13
Mt. Washington Obs.	33.3	20.2	26.8	66	Jun. 22	-42	Feb. 12	13869	99.32	4.60	Oct 15-16	266.1	22.9	Dec. 30-31	88	88	88	87	33.3	W	‡142	SE	Dec. 15+	28	7.8	45	73	247	266	80	19	336	0	164	244	63
NEW JERSEY																																				
Atlantic City	61.1	48.5	54.8	91	Jul. 27+	11	Jan. 18	4507	34.02	4.43	Sept. 10-11	12.5	7.6	Jan. 22	--	78	65	74	15.6	---	66	SE	Oct. 15	66	5.4	130	104	131	118	4	27	21	3	9	64	0
Newark	62.9	45.4	54.2	103	Jul. 31	5	Jan. 18	4884	36.95	4.06	Sept. 10-11	11.6	7.1	Jan. 10-11	73	72	53	63	10.6	SW	48	ESE	Oct. 15	--	6.0	108	104	153	116	4	21	18	18	15	91	0
Trenton	62.9	45.8	54.4	99	Jul. 31	7	Jan. 18	4788	37.60	3.30	Sept. 10-11	10.1	7.9	Jan. 10-11	--	--	--	--	9.1	S	57	S	Oct. 15	60	5.8	122	88	155	110	2	26	---	15	17	81	0
NEW MEXICO																																				
Albuquerque	72.8	46.2	59.5	100	Jul. 30+	8	Dec. 29	3585	4.51	.55	Jul. 22-23	4.3	2.1	Jan. 12-13	43	54	33	27	8.8	SE	54	E	Apr. 11+	82	3.6	203	97	65	48	3	35	4	74	3	85	0
Clayton	70.2	41.0	55.6	97	Jul. 11	1	Jan. 21	4429	13.72	4.67	May 16	8.4	2.4	Mar. 1	--	60	32	34	---	---	---	---	----	--	3.7	204	88	73	48	2	38	3	59	9	125	0
Roswell	78.4	45.8	62.1	107	Jul. 27	4	Dec. 29	2975	10.18	3.37	Oct. 6-7	4.9	2.5	Dec. 27-28	47	59	31	27	9.6	---	61	SW	Mar. 11+	--	3.5	200	107	58	37	2	36	3	122	0	100	0
NEW YORK																																				
Albany	57.8	38.1	48.0	95	Jul. 31+	-18	Jan. 14	6592	37.31	2.91	Aug. 31	42.6	9.9	Jan. 5-6	80	79	57	69	8.5	WNW	49	W	Apr. 8	45	6.9	63	108	194	145	13	37	24	9	41	147	14
Binghamton CO	58.9	39.9	49.4	97	Jul. 31	-12	Jan. 18	6160	36.28	1.91	Nov. 21	36.9	4.1	Jan. 16	AP 80	AP 82	AP 62	AP 72	AP 11.5	AP WNW	AP 72	AP S	Oct. 15	AP 48	AP 7.6	AP 38	AP 98	AP 229	171	11	AP 32	AP 44	13	37	131	2
Buffalo	56.8	40.2	48.5	90	Jun. 15+	1	Feb. 12+	6407	44.78	2.31	Feb. 16-17	89.2	15.8	Mar. 29-30	78	78	60	71	13.6	SW	63	SW	Oct. 15	50	7.3	43	116	206	173	25	38	15	2	40	125	0
New York CO	61.6	47.0	54.3	96	Jul. 31	9	Jan. 17-18	4744	38.09	4.98	Sept. 10-11	13.4	8.8	Jan. 10-11	73	59	61	68	12.7	NW	113	SE	Oct. 15	60	5.7	120	102	143	109	4	23	18	6	16	72	0
New York	62.9	47.7	55.3	99	Jul. 14	9	Jan. 18	4560	42.68	3.45	Sept. 10-11	13.5	6.8	Jan. 10-11	68	68	52	62	11.9	--	66	SE	Oct. 15	--	6.0	101	111	153	109	5	21	12	15	16	67	0
New York Met. Obs.	62.9	46.9	54.9	100	Jul. 31+	7	Jan. 18	4681	35.58	3.30	Sept. 10-11	13.7	7.2	Jan. 10-11	--	72	56	62	9.4	--	43	NE	Dec. 14	57	5.7	98	149	118	105	5	---	---	17	16	70	0
Rochester	57.0	39.3	48.2	92	Jul. 14	-1	Jan. 29+	6563	31.96	1.50	Oct. 2	78.9	15.6	Mar. 29-30	83	82	63	72	9.7	WSW	62	W	Mar. 3	47	7.1	51	118	196	156	26	38	7	4	46	133	2
Syracuse	56.8	40.2	48.5	90	Jun. 15+	1	Feb. 12+	6407	44.78	2.31	Feb. 16-17	89.2	15.8	Mar. 29-30	78	78	60	71	13.6	SW	63	SW	Oct. 15	50	7.3	43	116	206	173	25	38	15	2	40	125	0
NORTH CAROLINA																																				
Asheville CO	67.9	45.4	56.7	96	Jul. 1	8	Jan. 13	4145	37.33	2.42	Jan. 21-22	12.5	3.5	Feb. 28	AP 90	AP 88	AP 55	AP 72	7.7	NW	40	NW	Oct. 15	67	5.2	116	145	104	116	5	62	32	28	5	93	0
Charlotte	73.1	49.9	61.5	104	Sept. 6	15	Jan. 13	3209	39.30	2.78	Mar. 13-14	3.5	2.8	Jan. 22-23	76	81	47	61	7.1	S	57	NE	Dec. 6	71	5.4	120	120	125	104	2	55	27	88	0	72	0
Greensboro	70.3	46.6	58.5	102	Jul. 14+	12	Jan. 13	3883	40.77	6.24	Oct. 15	9.3	6.4	Jan. 22-23	81	81	49	64	7.9	SW	45	SSW	Dec. 30	70	5.3	124	127	114	106	4	46	21	57	3	94	0
Hatteras CO	69.5	57.8	63.7	91	Aug. 4	25	Jan. 13	2318	62.40	5.55	Aug. 30	.6	.6	Dec. 6	81	78	68	78	12.3	SSW	78	NW	Aug. 30	58	5.3	137	100	128	99	0	53	7	1	0	11	0

See reference notes at end of table.

ANNUAL CLIMATOLOGICAL DATA

State and Station	Temperature							Degree days	Precipitation						Relative humidity				Wind					Percent of possible sunshine	Average sky cover sunrise to sunset	Number of days										
	Averages			Extremes								Snow, Sleet, Hail									Fastest mile					Sunrise to sunset							Max temp.		Min. temp	
	Daily maximum	Daily minimum	Monthly	Highest	Date	Lowest	Date		Total	Greatest in 24 hrs	Date	Total	Greatest in 24 hrs.	Date	1:30a E.S.T.	7:30a E.S.T.	1:30p E.S.T.	7:30p E.S.T.	Average hourly speed	Prevailing direction	Speed	Direction	Date			Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Sleet, Hail 1.0 or more	Thunderstorms	Heavy fog	90° and above	32° and below	32° and below	Zero and below
NORTH CAROLINA (Cont'd.)																																				
Raleigh	72.1	48.1	60.1	104	Sept. 6+	13	Jan. 13	3477	41.63	4.10	Oct. 14-15	8.9	5.3	Jan. 22-23	80	82	49	64	7.7	SW	73	WNW	Oct. 15	--	5.1	131	135	99	102	4	48	27	59	1	77	0
Wilmington	74.3	53.1	63.7	102	Aug. 5+	20	Dec. 7+	2448	40.89	3.85	Oct. 14-15	.3	.3	Dec. 6	--	82	52	74	9.2	SW	82	SE	Oct. 15	71	4.6	157	112	96	96	0	46	27	57	0	41	0
Winston-Salem	70.4	48.3	59.4	102	Jul. 14+	12	Jan. 13	3707	43.82	6.24	Oct. 15	11.5	7.5	Jan. 22-23	73	75	47	59	8.3	NNW	40	WSW	Dec. 30	--	5.1	138	112	115	105	3	44	25	60	3	82	〃
NORTH DAKOTA																																				
Bismarck	54.8	31.2	43.0	98	Aug. 31+	-37	Jan. 21	8411	17.62	1.78	Jul. 1-2	22.4	3.7	Mar. 24-25	79	83	58	61	11.3	WNW	65	E	Jun. 27	61	6.2	92	115	158	95	9	34	7	16	58	188	38
Devils Lake CO	49.5	30.0	39.8	93	Jul. 18	-36	Jan. 21	9417	22.37	2.58	Jun. 7-8	38.1	4.5	Jan. 1-2	--	84	63	64	9.0	†NW	49	SW	Jun. 7	58	6.1	95	108	162	101	12	31	10	7	83	194	39
Fargo	51.9	32.1	42.0	99	Jul. 26	-30	Jan. 21	8803	13.18	1.33	Sept. 8-9	18.0	2.0	Mar. 24	78	81	61	63	14.8	SSE	91	SW	Jun. 7	56	6.5	82	107	176	82	6	32	15	8	83	185	34
Williston CO	52.8	32.0	42.4	93	Aug. 31+	-39	Jan. 21	8557	15.73	1.48	Sept. 13-14	39.8	6.1	Mar. 11-12	75	82	59	58	7.7	†W	37	SE	Jun. 5	61	6.8	74	99	192	102	12	31	12	13	67	176	33
OHIO																																				
Akron	60.0	40.2	50.1	100	Jul. 14	2	Feb. 12	6053	37.57	2.77	Oct. 14-15	38.8	5.6	Mar. 1	82	83	60	70	10.0	SW	--	--	----	--	6.8	59	119	187	151	14	47	18	16	38	141	0
Cincinnati	66.3	46.3	56.3	104	Jul. 14	6	Jan. 12	4560	37.30	2.18	Jun. 15-16	10.3	2.2	Jan. 14	AP 75	AP 80	AP 53	AP 61	6.4	SW	33	NW	Oct. 11	56	AP 6.5	AP 82	AP 106	AP 177	139	4	65	AP 15	46	13	91	0
Cleveland	61.5	43.0	52.3	99	Sept. 5+	2	Jan. 11	5521	39.65	3.44	Oct. 14-15	72.4	14.9	Mar. 1	79	78	60	68	10.6	S	58	SW	Apr. 7	45	7.0	57	106	202	163	20	45	3	22	20	127	0
Columbus	63.9	43.2	53.6	104	Jul. 14	5	Jan. 13	5185	34.31	1.68	Jun. 16-17	20.2	6.9	Feb.28 Mar.1	82	83	59	67	8.3	NNW	49	NW	Jul. 14	60	6.6	77	110	178	138	6	47	12	28	16	123	0
Dayton	63.1	44.1	53.6	102	Jul. 14	4	Jan. 13	5272	29.36	1.29	Dec. 27-28	19.5	2.8	Feb. 4	80	84	59	67	9.2	SSW	56	SW	Oct. 14+	63	6.6	76	107	182	133	8	53	11	31	22	116	0
Portsmouth CO	66.8	44.2	59.9	103	Jul. 14	3	Jan. 13	4543	40.87	3.43	Jun. 16-17	32.9	10.1	Feb.28 Mar.1	78	82	53	62	5.4	SSW	60	SW	Mar. 3	--	7.1	39	75	142	139	9	63	64	36	12	113	0
Sandusky CO	60.4	45.4	52.9	98	Sept. 5	4	Jan. 13	5394	34.12	3.30	Aug. 14-15	27.2	6.2	Feb.28 Mar.1	--	--	--	--	7.6	---	46	W	Apr. 7	54	6.2	88	121	156	139	8	52	6	17	23	103	0
Toledo	60.3	41.4	50.9	96	Jul. 14	1	Jan. 13	5928	32.19	2.17	Oct. 14	32.5	6.3	Mar. 29	83	83	61	71	11.1	SW	49	SW	Mar. 25	53	6.8	72	97	196	127	9	50	8	21	31	137	0
Youngstown	59.7	39.6	49.7	100	Jul. 14	0	Jan. 18+	6132	41.63	4.31	Oct. 15	50.3	4.0	Mar. 1	81	82	58	69	10.0	SW	45	WSW	Mar. 3	--	7.0	57	116	192	162	18	44	24	14	39	145	2
OKLAHOMA																																				
Oklahoma City	74.8	50.6	62.7	107	Jul. 14+	3	Jan. 21	3233	17.84	1.63	May 1	12.3	4.5	Dec. 28-29	65	72	46	47	13.7	SSE	61	S	Mar. 24	74	4.1	186	91	88	61	5	40	12	107	7	74	0
Tulsa	75.4	52.0	63.7	112	Jul. 14	5	Jan. 22	3126	24.48	2.96	Apr. 30	15.1	8.8	Dec. 28-29	64	72	46	47	11.8	S	56	N	Aug. 1	72	4.6	164	99	102	61	4	37	4	110	6	63	0
OREGON																																				
Astoria	57.7	43.0	50.4	78	Oct. 15+	24	Jan. 20	5265	75.29	3.55	Jan. 21-22	7.5	3.1	Jan. 17	87	91	77	75	6.9	SE	*40	SSW	Jan. 21+	--	7.6	57	64	244	199	4	8	36	0	0	41	0
Burns CO	61.0	32.9	47.0	95	Aug. 1+	-5	Dec. 27	6747	7.51	.64	Dec. 29-30	29.4	6.5	Dec. 29-30	59	69	47	37	---	---	---	---	----	--	5.5	134	79	152	68	11	5	9	19	9	188	1
Eugene	61.6	40.5	51.1	86	Aug. 1	20	Jan. 20	5009	37.83	2.66	Jan. 27	12.2	4.0	Jan. 15-16	--	--	72	61	---	---	---	---	----	--	7.0	71	87	207	138	5	4	65	0	0	76	0
Meacham	53.3	33.7	43.5	89	Aug. 1	-4	Jan. 20	7799	24.92	2.23	Dec. 29-30	100.6	18.4	Dec. 29-30	--	--	63	61	---	---	---	---	----	--	6.5	102	61	202	126	25	19	17	0	28	172	2
Medford	66.6	40.0	53.3	98	Jul. 13	16	Dec. 27	4552	16.25	1.07	Jan. 14-15	7.2	2.0	Mar. 10+	73	86	65	46	3.3	WNW	*35	S	Dec. 5	--	5.8	122	70	173	96	3	4	50	31	0	95	0
Pendleton	62.0	40.7	51.4	98	Aug. 1	-8	Jan. 20	5300	9.84	.73	Oct. 21	8.7	4.2	Jan. 15-16	60	68	53	46	8.6	W	*55	WNW	Jun. 3	--	6.1	107	84	174	91	4	14	34	17	18	94	2
Portland CO	60.8	46.0	53.4	86	May 17	17	Jan. 20	4249	46.57	1.86	Jan. 4	11.5	7.2	Jan. 16	AP 81	AP 88	AP 73	AP 63	AP 7.5	AP ESE	AP 47	AP S	Jan. 7+	AP 43	AP 7.6	AP 47	AP 70	AP 248	151	2	AP 8	AP 40	0	1	16	0
Roseburg	64.0	40.1	52.1	90	May 17	22	Jan. 25	4708	29.86	1.72	Dec. 5-6	14.0	9.1	Jan. 25-26	--	--	69	54	4.8	---	33	S	Oct. 6	46	7.0	65	91	209	127	5	5	67	1	1	78	0
Salem	62.1	40.0	51.1	87	May 17	18	Jan. 20	5017	42.48	2.14	Jan. 26-27	8.8	4.9	Jan. 15-16	84	91	70	60	6.9	S	*38	S	Jan. 4+	--	7.1	68	79	218	154	4	7	33	0	0	87	0
Sexton Summit CO	55.5	39.4	47.5	84	Jul. 13	18	Jan. 25	6375	33.05	1.90	Feb. 11-12	113.2	17.6	Jan. 15-16	--	--	70	64	---	---	---	---	----	--	5.7	127	79	159	118	31	2	144	0	21	99	0
PENNSYLVANIA																																				
Allentown	61.7	41.1	51.4	101	Jul. 31	-10	Jan. 18	5578	38.33	3.15	Aug. 30-31	17.5	7.6	Jan. 10-11	81	80	56	68	9.7	W	49	SE	Oct. 15	--	6.1	99	110	156	110	5	28	27	18	22	132	2
Harrisburg	62.9	44.3	53.6	101	Jul. 14	4	Jan. 18	5025	33.46	1.86	Aug. 20-21	15.7	7.8	Jan. 10-11	71	72	51	59	7.8	W	64	SE	Mar. 1	56	6.3	96	93	176	127	6	34	18	22	17	105	0
Philadelphia CO	64.4	48.4	56.4	99	Jul. 31	13	Jan. 18	4331	36.94	2.23	Jun. 15-16	13.1	9.4	Jan. 10-11	AP 74	AP 74	AP 50	AP 62	8.1	S	73	8	Oct. 15	57	6.0	106	111	148	107	3	21	8	21	13	60	0
Pittsburgh	61.2	42.3	51.8	99	Jul. 14	5	Jan. 18	5556	36.00	3.56	Oct. 15	26.4	5.5	Mar. 1	76	78	56	65	10.8	WSW	48	WSW	Mar. 3	54	6.9	56	117	192	147	8	45	11	11	28	125	0
Reading CO	63.7	45.7	54.7	102	Jul. 31	3	Jan. 3	4765	35.96	2.11	Aug. 8-9	17.1	8.2	Jan. 10-11	--	74	--	--	10.6	NW	72	SE	Oct. 15	50	6.3	89	102	174	120	3	35	6	26	16	88	0

See reference notes at end of table.

ANNUAL CLIMATOLOGICAL DATA

State and Station	Temperature							Degree days	Precipitation						Relative humidity				Wind					Percent of possible sunshine	Average sky cover sunrise to sunset	Number of days										
	Averages			Extremes								Snow, Sleet, Hail									Fastest mile					Sunrise to sunset							Max. temp.		Min. temp.	
	Daily maximum	Daily minimum	Monthly	Highest	Date	Lowest	Date		Total	Greatest in 24 hrs.	Date	Total	Greatest in 24 hrs.	Date	1:30a E.S.T.	7:30a E.S.T.	1:30p E.S.T.	7:30p E.S.T.	Average hourly speed	Prevailing direction	Speed	Direction	Date			Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Sleet, Hail 1.0 or more	Thunderstorms	Heavy fog	90° and above	32° and below	32° and below	Zero and below
PENNSYLVANIA (Cont'd.)																																				
Scranton CO	59.8	41.7	50.8	96	Jul. 31	-6	Jan. 18	5742	34.22	1.71	Aug. 30-31	20.7	4.4	Jan. 10-11	--	--	56	--	6.4	---	45	SE	Oct. 15	50	6.5	89	104	172	134	6	31	10	10	29	115	1
Williamsport	61.7	40.9	51.3	99	Jul. 31+	-5	Jan. 18	5654	37.12	2.88	May 3-4	25.7	6.1	Nov. 2	--	78	53	64	---	---	75	ESE	Oct. 15	--	6.9	64	109	192	147	8	---	---	21	23	128	1
RHODE ISLAND																																				
Block Island	57.0	44.3	50.7	83	Jun. 26	4	Feb. 13	5405	51.14	4.04	Sept. 10-11	18.6	6.2	Jan. 11-12	--	82	70	--	---	---	--	---	----	--	6.4	83	114	168	132	8	30	75	0	16	87	0
Providence	59.5	41.3	50.4	94	Jul. 14	-8	Jan. 18	5720	51.53	4.37	Sept. 11	27.0	6.8	Dec. 21	79	76	57	70	11.6	SW	90	ESE	Aug. 31	52	6.3	99	99	167	138	9	27	32	2	22	121	3
SOUTH CAROLINA																																				
Charleston CO	74.4	59.4	66.9	102	Aug. 5+	25	Jan. 13	1732	31.02	5.17	Oct. 14-15	T	T	Dec. 6+	AP 87	AP 85	AP 51	AP 73	9.9	AP NNE	45	NW	Oct. 15	75	4.9	143	115	107	77	0	50	15	44	0	6	0
Columbia	77.4	51.3	64.4	107	Jun. 27	17	Dec. 8	2584	27.38	2.91	Aug. 2-3	T	T	Jan. 24	83	86	47	63	6.4	SSW	60	W	Mar. 31	77	4.7	148	117	100	94	0	52	24	113	0	64	0
Florence	77.3	52.3	64.8	108	Jun. 27	20	Jan. 13	2426	27.50	6.36	Oct. 14-15	T	T	Dec. 20+	--	81	44	62	---	---	--	---	----	--	5.0	137	128	100	80	0	49	9	108	0	50	0
Greenville	72.7	51.0	61.9	101	Jun. 27+	16	Jan. 13	3116	35.05	3.08	Jan. 15-16	T	T	Dec. 18+	71	75	46	56	8.7	NE	70	SE	Aug. 17	69	5.3	129	135	101	103	0	51	13	84	0	53	0
Spartanburg	72.9	51.0	62.0	104	Jun. 27	17	Jan. 13	3140	31.16	2.96	Jan. 15-16	T	T	Dec. 19+	--	--	--	--	---	---	--	---	----	--	---	---	---	---	96	0	46	14	84	0	58	0
SOUTH DAKOTA																																				
Huron	57.9	35.0	46.5	104	Aug. 15+	-30	Jan. 21	7506	13.32	1.22	Mar. 11-12	29.3	10.0	Mar. 12	80	84	60	61	11.4	SSE	73	NW	Nov. 23	62	6.2	100	103	162	82	9	30	14	24	59	176	22
Rapid City	61.9	36.0	49.0	109	Jul. 12	-17	Jan. 20	6563	15.29	1.46	May 22-23	44.7	11.7	Mar. 12-13	66	70	47	50	11.3	NNW	53	NW	Mar. 24	57	5.8	104	120	141	95	11	43	8	36	34	155	16
Sioux Falls	57.7	35.9	46.8	102	Jul. 13	-26	Jan. 21	7374	24.69	2.18	Sept. 8-9	31.9	7.7	Mar. 12	74	78	56	59	11.5	SSE	*55	WNW	Jun. 18	--	6.1	90	122	153	89	6	57	17	24	56	172	17
TENNESSEE																																				
Bristol	68.9	45.2	57.1	100	Sept. 7+	5	Jan. 13	4221	39.44	3.10	Jun. 13	19.6	12.7	Feb.28 Mar.1	--	84	52	63	----	---	--	---	----	--	5.8	110	103	152	127	4	53	28	44	5	104	0
Chattanooga	73.6	49.1	61.4	103	Jul. 14	14	Jan. 13	3324	50.62	3.34	Jan. 20-21	.1	.1	Jan. 11	82	86	51	61	4.5	SSW	49	NW	Feb. 16	64	5.5	119	105	141	88	0	55	33	95	1	76	0
Knoxville	71.3	49.0	60.2	103	Sept. 5	11	Jan. 13	3623	43.08	3.79	Jan. 14-15	9.7	7.6	Feb.28 Mar.1	75	80	52	58	7.1	WSW	56	W	Jul. 5	58	5.5	116	118	131	111	3	43	21	76	3	74	0
Memphis	74.9	52.9	63.9	104	Jul. 18+	19	Jan. 13	2920	38.47	3.87	Jan. 14-15	3.8	2.6	Jan. 10-11	73	78	51	56	10.2	S	43	N	Dec. 5	71	5.1	139	106	120	89	2	52	6	109	2	56	0
Nashville	72.4	50.0	61.2	105	Sept. 5+	11	Jan. 13+	3517	42.73	3.00	Sept. 20-21	1.7	1.0	Nov. 2	78	85	55	62	7.0	S	42	N	Aug. 9+	59	5.3	134	110	121	109	1	63	6	96	2	75	0
Oak Ridge	70.8	46.9	58.9	101	Jul. 14+	11	Jan. 13	3842	56.70	4.73	Dec. 28-29	4.2	1.9	Feb.28 Mar.1	--	--	--	--	4.4	W	30	SW	Dec. 29+	--	5.6	124	98	143	107	2	55	33	74	3	90	0
TEXAS																																				
Abilene	79.3	54.7	67.0	107	Jul. 26+	14	Jan. 21	2132	16.02	2.00	Apr. 11-12	5.9	4.0	Dec. 28-29	57	68	42	40	13.4	SSE	61	NW	May 6	84	4.0	198	81	86	43	2	33	7	125	1	33	0
Amarillo	74.8	46.1	60.5	103	Jul. 25	4	Jan. 21	3472	13.89	1.27	Apr. 11	6.4	1.8	Jan. 10	55	64	37	35	14.2	S	57	SW	Dec. 4+	76	4.0	192	82	91	54	3	41	13	96	7	93	0
Austin	82.2	58.6	70.4	109	Jul. 26	23	Jan. 22	1298	11.42	1.68	May 25-26	T	T	May 11+	71	81	48	48	10.3	S	45	N	Feb. 27	67	4.7	151	112	102	59	0	25	13	131	0	12	0
Brownsville	83.8	66.1	75.0	101	Jul. 26	35	Jan. 22	336	22.06	6.67	Oct. 4	.0	.0	-----	85	89	58	70	12.6	SE	52	E	Jun. 25	70	5.4	102	162	101	70	0	26	31	122	0	0	0
Corpus Christi	83.1	63.8	73.5	102	Sept. 11	29	Jan. 22+	597	16.02	2.55	Oct. 22-23	T	T	Jan. 21	84	87	57	69	12.7	SSE	46	N	Oct. 22	72	5.4	115	130	120	54	0	27	17	122	0	3	0
Dallas	80.0	57.0	68.5	111	Jul. 25	13	Jan. 22	2006	26.43	2.70	May 10-11	2.8	1.4	Jan. 21	65	76	49	49	10.5	SSE	65	N	Jun. 15	69	4.1	181	93	91	62	2	36	9	127	2	29	0
Del Rio	83.1	58.8	71.0	110	Jul. 27	24	Jan. 22	1156	14.78	2.06	Jun. 26-27	T	T	Apr. 30	--	73	48	40	8.6	---	42	NW	Dec. 28+	67	4.7	148	111	106	40	0	23	2	144	0	7	0
El Paso	79.0	52.1	65.6	103	Jul. 27+	15	Dec. 29	2169	6.39	1.70	Aug. 23-24	.6	.6	Dec. 28	38	48	30	25	11.1	S	66	NW	Feb. 18	89	3.6	199	95	71	43	0	34	0	111	0	49	0
Fort Worth	79.5	56.7	68.1	109	Jul. 25	13	Jan. 22	2065	19.55	2.66	May 10-11	3.0	1.7	Mar. 5	63	74	45	46	13.5	S	*55	WNW	Mar. 24	--	4.2	187	92	86	58	2	32	7	125	2	30	0
Galveston CO	75.8	65.9	70.9	97	Aug. 30	29	Jan. 22	854	22.29	3.13	Nov. 3-4	T	T	Dec. 17	AP 81	AP 83	AP 68	AP 75	12.4	AP SE	50	NW	Dec. 28	70	AP 5.0	AP 135	AP 115	AP 115	71	0	AP 37	AP 29	16	0	3	0
Houston CO	80.1	62.5	71.3	105	Jul. 26	24	Jan. 22	935	31.78	5.39	Jul. 29-30	.0	.0	-----	AP 81	AP 85	AP 55	AP 63	10.0	†SE	36	SE	Oct. 4	70	5.2	124	125	116	80	0	45	21	109	0	5	0
Laredo	87.0	63.9	75.5	109	Jul. 27	33	Dec. 29	550	13.50	2.12	Jun. 25-26	.0	.0	-----	69	80	47	44	13.7	SE	*45	E	Sept 6	--	4.8	145	119	101	47	0	24	9	181	0	0	0
Lubbock	76.0	46.6	61.3	101	Jul. 27	3	Dec. 29	3173	13.99	2.66	Oct. 5-6	9.6	5.6	Dec. 28	58	71	41	38	13.8	S	*50	NNW	Feb. 19	--	3.8	193	103	89	37	3	22	12	100	4	96	0
Midland	78.8	52.1	65.5	106	Jul. 27	17	Dec. 29	2237	11.98	1.72	May 24	1.2	1.2	Dec. 28	53	65	36	32	7.8	SE	45	NNE	Feb. 6	--	3.7	202	89	74	42	1	37	13	122	0	42	0

See reference notes at end of table.

ANNUAL CLIMATOLOGICAL DATA

State and Station	Temperature							Degree days	Precipitation						Relative humidity				Wind					Percent of possible sunshine	Average sky cover sunrise to sunset	Number of days										
	Averages			Extremes					Total	Greatest in 24 hrs.	Date	Snow, Sleet, Hail							Average hourly speed	Prevailing direction	Fastest mile					Sunrise to sunset			Precipitation 01 inch or more	Snow, Sleet, Hail 1.0 or more	Thunderstorms	Heavy fog	Max. temp.		Min. temp.	
	Daily maximum	Daily minimum	Monthly	Highest	Date	Lowest	Date					Total	Greatest in 24 hrs.	Date	1:30a E.S.T.	7:30a E.S.T.	1:30p E.S.T.	7:30p E.S.T.			Speed	Direction	Date			Clear	Partly cloudy	Cloudy					90° and above	32° and below	32° and below	Zero and below
TEXAS (Cont'd.)																																				
Port Arthur	79.4	59.5	69.5	100	Jun. 30	26	Jan. 22	1235	33.07	7.18	May 25	T	T	Jan. 21	87	89	60	72	11.5	S	49	SE	Apr. 30	66	5.2	125	134	106	76	0	53	37	104	0	5	0
San Angelo	79.9	54.7	67.3	105	Jul. 26	18	Jan. 11	1879	9.92	1.83	May 23	2.6	2.5	Jan. 21	--	69	42	37	----	---	--	---	----	--	4.0	198	94	73	41	1	27	4	122	0	32	0
San Antonio	83.0	59.7	71.4	106	Jul. 27+	27	Jan. 11	1084	13.70	1.76	Jun. 26-27	T	T	Jun. 18+	68	76	46	44	9.0	SSE	56	SE	Jun. 18+	73	4.8	144	121	100	54	0	22	16	139	0	12	0
Victoria	82.9	61.5	72.2	107	Jul. 26+	26	Jan. 22	841	19.85	2.88	Oct. 22-23	T	T	Nov. 14	--	86	51	60	10.2	SSE	‡62	NW	Nov. 14	--	5.1	135	122	108	73	0	40	19	132	0	5	0
Waco	80.8	57.3	69.1	108	Jul. 25	19	Jan. 22	1756	14.92	1.88	May 10	T	T	Dec. 28	68	79	51	49	11.9	S	66	NW	Jun. 2	--	4.4	169	98	98	51	0	36	10	130	1	21	0
Wichita Falls	78.3	54.2	66.3	110	Jul. 25	12	Jan. 21	2471	21.14	3.32	May 11-12	6.0	4.0	Dec. 28	58	67	43	41	10.2	S	*60	W	Jun. 14	--	3.6	213	74	78	53	3	41	3	122	5	47	0
UTAH																																				
Milford	67.0	34.1	50.6	104	Jun. 23	-5	Dec. 28	5848	8.98	.91	May 21-22	33.2	6.5	Nov. 29	--	70	42	36	----	---	--	---	----	--	4.5	166	97	102	50	12	32	9	44	9	183	1
Salt Lake City	65.2	40.1	52.7	102	Aug. 2	7	Dec. 28+	5346	12.43	1.62	Aug. 4	32.7	7.2	Jan. 24-25	63	68	44	43	9.2	SE	71	NW	Mar. 10	71	5.0	143	88	134	69	12	32	12	48	13	135	0
VERMONT																																				
Burlington	53.6	35.7	44.7	91	Jun. 22	-22	Feb. 13+	7609	39.37	1.64	Feb. 16-17	109.2	10.8	Feb. 16-17	83	80	65	74	10.0	S	70	SE	Oct. 15	47	7.4	53	88	224	184	26	17	12	2	63	152	19
VIRGINIA																																				
Lynchburg	67.9	46.3	57.1	103	Jul. 14	9	Jan. 13	4191	35.17	4.98	Oct. 15	8.6	3.9	Jan. 22	--	77	49	61	8.4	SSW	43	NW	Jul. 15+	67	5.5	122	109	134	103	3	41	25	38	9	94	0
Norfolk	69.4	51.1	60.3	99	Jul. 3	19	Dec. 22+	3325	43.19	2.74	Aug. 29	5.2	3.6	Dec. 6	79	78	54	69	9.4	SW	78	S	Oct. 15	64	5.2	131	115	119	102	2	38	19	39	3	49	0
Richmond	70.4	47.1	58.8	103	Sept. 7+	10	Jan. 13	3885	31.45	1.69	Aug. 18+	9.7	5.6	Jan. 22-23	80	79	48	64	8.2	S	68	SE	Oct. 15	65	5.3	130	116	119	106	4	39	20	60	4	87	0
Roanoke	68.3	45.9	57.1	104	Jul. 14	12	Jan. 13	4225	39.88	4.95	Oct. 15	12.2	6.8	Jan. 22	74	75	47	59	8.6	NW	--	---	----	--	5.6	105	129	131	105	4	44	18	50	7	97	0
WASHINGTON																																				
Olympia	58.6	38.8	48.7	86	Aug. 1	7	Jan. 20	5868	55.24	2.14	Jan. 4-5	25.0	7.0	Jan. 17-18	83	89	72	62	6.7	SSW	*39	S	Jan. 2	--	7.8	38	86	241	171	10	3	89	0	1	92	0
Seattle CO	58.3	46.0	52.2	82	Jul. 6	22	Jan. 20	4605	38.19	2.19	Jan. 20-21	16.9	5.8	Jan. 20-21	AP 79	AP 86	AP 71	AP 61	9.7	†N	64	S	Feb. 19	38	7.7	50	76	239	149	6	5	9	0	2	14	0
Seattle-Tacoma	57.0	42.0	49.5	80	Aug. 1+	16	Jan. 20	5546	41.27	1.83	Jan. 21-22	23.3	6.2	Jan. 17-18	84	90	77	67	10.5	SW	--	---	----	--	7.7	44	78	243	167	8	10	65	0	4	60	0
Spokane	56.3	36.9	46.6	94	Jul. 6	-9	Jan. 20	6805	16.26	1.48	Jan. 21-22	58.3	12.7	Jan. 21	68	77	60	51	8.1	SW	42	S	Jan. 14	56	6.8	72	96	197	104	17	13	43	4	27	141	2
Stampede Pass CO	43.2	31.7	37.5	76	Aug. 1+	-5	Jan. 20	9947	98.02	3.76	Jan. 13-14	511.1	25.3	Mar. 26-27	--	--	--	--	----	---	--	---	----	--	7.5	64	56	245	207	84	4	250	0	99	192	3
Tatoosh Island CO	52.8	45.0	48.9	67	Oct. 16+	23	Jan. 15	5773	86.19	3.79	Nov. 4-5	14.3	4.2	Jan. 16-17	86	87	83	81	14.7	E	70	S	Jan. 3	31	8.2	31	57	277	214	6	8	36	0	2	11	0
Walla Walla CO	62.4	44.3	53.4	99	Aug. 1	-6	Jan. 20	4767	13.00	1.08	Dec. 29-30	11.5	3.2	Mar. 17	--	--	55	--	5.9	---	34	W	Jun. 3+	55	6.0	103	95	167	94	5	14	21	18	19	64	2
Yakima	61.8	35.2	48.5	96	Jul. 14	-19	Jan. 20	6113	6.55	.83	Sep. 16	28.0	7.9	Jan. 27	69	78	51	45	8.0	W	*45	SW	Apr. 5	--	6.1	107	86	172	59	7	5	12	11	21	157	4
WEST VIRGINIA																																				
Charleston	66.9	45.6	56.3	102	Jul. 14	6	Jan. 13	4369	43.73	3.17	Jul. 20-21	33.2	10.5	Jan. 10-11	80	83	54	65	8.0	S	45	N	Jul. 18	--	6.9	60	118	187	146	7	55	102	31	14	100	0
Elkins	61.9	38.6	50.3	95	Jul. 14	-6	Jan. 18	5757	46.34	2.90	Jul. 14-15	53.0	8.7	Jan. 10-11	--	--	--	--	5.5	NW	57	W	Apr. 27	--	7.2	54	99	212	172	20	59	85	3	32	147	3
Huntington	69.1	46.5	57.8	105	Jul. 14	3	Jan. 13	4127	39.45	4.23	Jul. 20-21	27.8	10.3	Feb. 28 - Mar. 1	--	--	--	--	----	---	--	---	----	--	---	---	---	---	132	7	--	---	55	8	94	0
Parkersburg CO	66.0	45.4	55.7	102	Jul. 14	4	Jan. 13	4591	43.96	3.40	Oct. 15	26.0	7.0	Mar. 1	--	--	--	--	5.9	---	66	NW	Nov. 29	--	6.3	87	111	167	148	8	55	---	36	15	104	0
WISCONSIN																																				
Green Bay	54.0	34.8	44.4	91	Sept. 6+	-19	Jan. 17	7760	31.21	3.68	Oct. 2-3	29.9	4.0	Mar. 12-13	80	81	62	69	8.9	SW	60	SW	Mar. 25	52	6.6	82	100	183	131	7	40	22	3	62	168	15
La Crosse	56.5	38.6	47.6	95	Jul. 19	-20	Jan. 17	7048	32.74	3.84	Apr. 30	27.1	5.3	Jan. 26-27	--	81	60	64	9.7	NW	*60	NNW	Jun. 29	--	6.9	74	93	198	112	10	52	13	9	63	152	12
Madison CO	56.0	40.0	48.0	93	Jun. 25	-15	Jan. 17	6786	35.62	3.48	Jun. 21	34.1	5.8	Nov. 30-Dec. 1	AP 79	AP 80	AP 59	AP 67	AP 10.0	AP NW	AP 70	AP SW	Mar. 25	AP 59	AP 6.7	AP 80	AP 96	AP 189	108	13	AP 47	AP 18	3	62	145	7
Milwaukee	56.4	40.4	48.4	95	Jul. 12+	-13	Jan. 17	6592	35.91	2.78	Jun. 2-3	40.1	8.2	Dec. 29-30	78	79	62	70	11.4	SW	73	SW	Mar. 25	58	6.6	78	95	192	132	14	51	16	7	39	136	4
WYOMING																																				
Casper	61.6	35.0	48.3	104	Jul. 12	-11	Mar. 2+	6689	7.70	.95	Mar. 18	69.0	14.6	Mar. 18	58	65	40	40	14.7	SW	*58	SSW	Jan. 17	--	5.6	117	118	130	79	18	34	5	41	30	160	9
Cheyenne	61.5	35.1	48.3	100	Jun. 23	-12	Mar. 31	6445	10.34	1.19	Mar. 12-13	42.1	10.9	Mar. 29-30	61	64	38	42	13.1	WNW	66	W	Jan. 18	65	5.2	132	123	110	71	12	45	18	12	28	165	8

See reference notes at end of table.

ANNUAL CLIMATOLOGICAL DATA

Table 10—Continued

YEAR 1954

State and Station	Temperature							Degree days	Precipitation						Relative humidity				Wind					Percent of possible sunshine	Average sky cover sunrise to sunset	Number of days										
	Averages			Extremes								Snow, Sleet, Hail									Fastest mile					Sunrise to sunset							Max. temp.		Min. temp.	
	Daily maximum	Daily minimum	Monthly	Highest	Date	Lowest	Date		Total	Greatest in 24 hrs.	Date	Total	Greatest in 24 hrs.	Date	1:30a E.S.T.	7:30a E.S.T.	1:30p E.S.T.	7:30p E.S.T.	Average hourly speed	Prevailing direction	Speed	Direction	Date			Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Sleet, Hail 1.0 or more	Thunderstorms	Heavy fog	90° and above	32° and below	32° and below	Zero and below
WYOMING (Cont'd.)																																				
Lander	61.2	33.2	47.2	101	Jul. 11	-13	Mar. 3	6974	6.41	1.24	Apr.30-May 1	68.9	15.7	Apr.30-May 1	55	62	42	41	7.5	---	59	SW	Jan. 3	77	5.1	124	132	109	52	18	27	2	34	32	189	8
Sheridan	61.3	32.2	46.8	106	Jul. 10	-24	Jan. 20	7138	13.17	.96	Feb. 26	89.3	9.8	Mar. 18	--	74	48	48	8.5	NW	65	NW	Nov. 26	65	5.7	112	108	145	101	28	31	3	40	37	185	17
PACIFIC AREA																																				
Canton Island	89.2	77.8	83.5	95	Mar. 13	71	Jun. 5	0	7.79	1.44	Jul. 22-23	.0	.0	-----	76	80	80	64	---	--	*32	ESE	Jan. 27	--	5.1	117	168	80	57	0	0	0	162	0	0	0
Hilo	80.5	65.4	73.0	87	Sept. 1+	56	Mar. 13+	0	162.33	10.10	Dec. 8-9	.0	.0	-----	85	87	81	68	6.6	SW	*38	N	Mar. 6	48	6.9	48	134	183	265	0	7	0	0	0	0	0
Honolulu CO	79.7	70.7	75.2	85	Oct. 2+	61	Dec. 18+	0	30.65	6.18	Nov. 28-29	.0	.0	-----	AP 72	AP 77	AP 73	AP 59	AP 11.4	AP ENE	AP 45	AP SW	Nov. 28	AP 68	AP 5.6	AP 141	AP 108	AP 116	148	0	AP 8	AP 0	0	0	0	0
Koror CO	87.9	74.8	81.4	93	Apr. 24	70	Jul. 3	0	147.72	5.56	May 4-5	.0	.0	-----	75	89	--	79	----	---	---	---	----	--	8.1	10	108	247	278	0	50	0	81	0	0	0
Lihue	80.3	68.1	74.2	86	Oct. 1+	54	Feb. 6+	2	58.01	8.36	Nov 27-28	.0	.0	-----	79	83	80	68	11.6	NE	43	S	Nov. 28	45	6.6	53	161	151	202	0	12	0	0	0	0	0
Ponape CO	86.5	74.1	80.3	92	Oct. 13	69	Dec. 3+	0	196.60	6.06	Dec. 24	.0	.0	-----	79	90	--	79	----	---	---	---	----	--	8.3	2	106	257	308	0	27	0	27	0	0	0
Truk (Moen Island)	85.6	76.3	81.0	88	Nov. 26+	71	Nov. 1	0	162.13	10.44	Dec. 25-26	.0	.0	-----	81	88	--	82	----	---	---	---	----	--	8.8	5	67	293	271	0	24	0	0	0	0	0
Wake	83.6	75.0	79.3	88	Oct. 7+	64	Dec. 4	0	42.23	6.24	Nov. 28-29	.0	.0	-----	76	80	81	72	14.1	E	*48	ESE	Aug. 11	--	5.3	117	154	94	197	0	6	0	0	0	0	0
Yap CO	87.4	75.9	81.7	92	Sep. 2+	72	Oct. 1+	0	102.20	7.09	Nov. 5	.0	.0	-----	76	88	--	79	----	---	---	---	----	--	8.5	9	88	268	240	0	11	0	62	0	0	0
CARIBBEAN																																				
San Juan	83.0	72.7	77.9	92	May 9	66	Feb. 20+	0	56.45	3.36	Sept. 16	.0	.0	-----	a 85	a 83	a 69	a 78	10.4	E	32	E	Jul. 14+	74	5.7	79	190	96	216	0	42	0	8	0	0	0
Swan Island	84.9	75.6	80.3	90	Sept. 3+	66	Feb. 10+	0	62.88	2.49	Nov. 12	.0	.0	-----	82	81	73	80	9.2	---	29	---	Dec. 18+	--	5.9	94	146	125	191	0	0	0	3	0	0	0
ALASKA																																				
Anchorage	42.6	25.9	34.3	76	Jul. 7+	-29	Dec. 28+	11093	12.62	1.07	Aug. 11-12	61.9	9.5	Dec. 20-21	68	73	68	59	5.2	NNE	*37	SW	Dec. 17	53	6.9	79	69	217	106	18	0	35	#16	119	194	53
Annette	49.7	39.4	44.6	80	Aug. 24	8	Jan. 25	7372	111.38	3.68	Oct. 15-16	50.7	9.7	Dec. 4	82	84	79	76	13.9	SSE	*58	SSE	Dec. 19	--	8.0	47	49	269	225	15	5	13	#15	22	94	0
Barrow	17.2	4.5	10.9	71	Aug. 8	-48	Feb. 24+	19686	5.52	.86	Jul. 27-28	24.1	2.9	Jun. 12-13	77	78	78	75	10.7	---	47	NW	Sep. 17	--	c ---	c 46	c 50	c 201	91	7	0	64	#1	249	300	167
Bethel	36.1	19.2	27.7	79	Jun. 19	-42	Jan. 6	13517	17.19	1.55	Sep. 28-29	54.3	5.3	Dec. 30-31	79	87	82	73	11.0	NNE	*49	SSE	Mar. 14	--	7.2	70	61	234	127	22	2	10	#9	133	218	91
Cordova	46.3	28.7	37.5	77	Jul. 7	-18	Dec. 27	9907	83.35	4.69	Oct. 28-29	100.7	15.3	Mar 10-11	83	86	77	72	5.1	E	*55	E	Oct. 23	--	7.6	62	51	252	172	32	2	10	#11	55	190	19
Fairbanks	35.7	13.6	24.7	83	Jun. 4	-54	Dec. 26	14638	10.17	1.51	Jul. 20-21	51.9	6.7	Jan. 23	65	74	66	54	4.2	N	34	W	Aug. 19	--	6.5	87	97	181	82	15	1	21	#51	152	240	122
Juneau	46.9	32.6	39.8	80	Jun. 4	-8	Jan. 27	9107	41.18	1.42	Sep. 20-21	73.5	7.8	Apr. 10-11	79	83	76	68	7.8	ESE	50	SE	Apr. 16+	38	7.9	58	39	268	196	23	0	13	#20	52	155	9
Kotzebue	26.8	13.1	19.9	73	Jun. 8	-43	Feb. 3	16361	11.88	1.48	Aug. 23	49.6	8.6	Mar. 22-23	79	82	81	77	13.6	ESE	*55	ESE	Mar. 15	--	6.4	101	66	198	93	16	0	18	#2	193	249	126
McGrath	34.3	14.5	24.4	79	Jun. 7	-54	Dec. 28+	14692	19.96	1.15	Jul. 17	52.3	9.1	Nov. 27-28	73	82	77	65	3.8	N	*29	S	Nov. 30	--	6.9	79	70	216	127	16	4	13	#23	152	226	118
Nome	31.7	17.7	24.7	72	Jun. 9	-36	Feb. 27	14585	21.66	1.77	Jul. 26-27	51.7	5.8	Jan. 14	77	79	76	73	9.9	E	57	SW	Nov. 30	47	6.4	105	62	198	108	17	0	24	#1	163	231	96
Northway	31.4	9.5	20.5	83	Aug. 7	-58	Dec. 28+	16140	7.48	.58	Jun. 9	31.3	3.5	Dec. 1-2	76	84	72	63	5.4	NW	*28	NW	Feb. 25	--	7.4	52	80	233	84	11	14	24	#39	169	256	123
St. Paul Island	36.6	28.3	32.5	53	Aug. 3	-12	Feb. 25	11740	22.41	1.32	Oct. 6-7	45.5	6.1	Mar. 3	87	89	89	86	---	---	--	---	----	--	8.2	34	62	269	180	13	0	55	#0	86	214	20
Yakutat	45.8	30.4	38.1	72	Jul. 27	-10	Jan. 28	9697	91.58	3.01	Oct 30-31	198.3	14.0	Dec. 6-7	86	89	81	76	7.9	ESE	*55	S	Nov. 20	--	7.9	59	42	264	207	44	0	45	#3	46	174	14

Data from airport unless otherwise indicated.
CO after station name indicates city office data, except where certain elements are from the airport, which are indicated by AP above each value.
* Data entered in column headed "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.
+ Also on earlier dates.
† Wind direction to 8 compass points only.
‡ Peak gust.

% Data from January 1 through July 31 compiled at Brainard Field, data for balance of year from Bradley Field.
# Number of days Maximum 70°F or above for Alaskan Stations.
a Computed as of 2:30a, 8:30a, 2:30p and 8:30p E.S.T.
b Computed as of noon local time.
c Sun below horizon November 18 - January 24.
d Maximum hourly average.

Table 10a

NORMALS, MEANS AND EXTREMES

State and Station	Elevation ground (feet)	Temperature (°F)								Normal degree days (1921-1950)		Precipitation (inches)									Relative humidity (percent)						Wind Speed (m.p.h.)			Sunshine (percent of possible)		Annual mean number of days									
		Normal (1921-1950)					Period Extremes			January	Seasonal	Normal (1921-1950)			Extremes			Snow, sleet, hail			January			July			Mean hourly		Fastest mile	January	July	Sunrise to sunset			Precipitation .01 inch or more	Snow, sleet, hail 1.0 inch or more	Thunderstorms	Heavy fog	Temperature		
		January		July		Annual	Length, yrs.	Record highest	Record lowest			Wettest month	Driest month	Annual	Wettest month	Driest month	Maximum in 24 hours	Mean total		Extreme	7:30 a.m. EST	1:30 p.m. EST	7:30 p.m. EST	7:30 a.m. EST	1:30 p.m. EST	7:30 p.m. EST	January	July				Clear	Partly cloudy	Cloudy					Max.	Min.	
		Daily maximum	Daily minimum	Daily maximum	Daily minimum													January	Seasonal	Maximum in 24 hours																			90° and above	32° and below	Zero and below
ALABAMA							71	112	-18																																
Birmingham	610	55.5	34.9	90.2	69.0	62.5	59	107	-10	623	2780	6.31	2.71	53.52	20.12	0.00	8.84	1.0	1.8	11.0	81	61	67	84	56	68	8.2	5.4	65	45	62	132	116	117	117	*	67	5	59	39	*
Mobile	211	62.2	43.2	89.4	72.0	67.3	13	104	11	416	1612	8.97	3.75	67.57	19.29	.05	6.52	T	.1	1.6	88	64	78	90	63	77	---	---	--	--	--	122	128	115	127	*	85	27	72	15	0
Montgomery	198	59.7	38.7	91.3	71.0	65.4	82	107	-5	517	2137	6.50	2.36	53.66	20.10	T	9.98	.2	.6	11.0	83	61	67	85	58	68	7.7	5.8	60	51	66	132	119	114	113	*	55	7	69	20	*
ARIZONA							60	127	-33																																
Flagstaff	6993	38.9	11.7	79.2	51.1	44.6	56	94	-30	1231	7525	2.60	.53	18.47	8.77	.00	3.59	17.1	68.1	22.0	75	52	54	68	35	41	---	---	--	--	--	139	132	94	87	21	37	3	2	198	9
Phoenix	1114	64.8	34.5	105.1	75.1	69.4	59	118	16	474	1698	1.00	.06	7.16	6.47	.00	4.98	T	T	1.0	70	40	38	52	30	23	4.3	5.9	65	76	83	228	90	47	36	0	26	*	170	23	0
Prescott	5014	50.2	20.4	90.9	61.0	55.2	12	102	-5	921	4533	3.70	.23	15.98	9.61	.00	3.08	7.3	20.7	12.4	71	61	48	57	43	32	7.3	7.8	72	71	70	184	98	83	62	7	47	3	46	133	*
Tucson	2558	63.1	36.3	99.4	73.0	67.6	14	110	16	474	1776	2 15	.21	10.66	4.31	.00	2.73	.5	1.1	3.5	64	40	36	56	32	30	6.9	7.0	59	78	74	190	94	81	49	*	38	*	148	22	0
Winslow	4880	46.2	19.2	92.6	61.8	55.0	23	104	-18	1001	4702	1.62	.29	7.83	2.72	.00	1.47	2.5	7.9	6.0	74	50	42	62	31	30	7.8	9.0	--	--	--	178	98	89	50	3	35	3	68	135	3
Yuma	199	67.2	43.3	107.7	81.5	74.7	77	123	22	318	951	.64	.01	3.39	6.25	.00	4.01	T	T	T	57	32	32	60	28	25	6.1	6.1	56	82	92	288	57	20	15	0	9	1	159	3	0
ARKANSAS							64	120	-29																																
Fort Smith	458	50.6	29.4	94.2	70.4	62 0	73	113	-15	775	3188	5.06	2.56	41.56	15.02	.05	8.58	2.1	5.4	18.3	80	65	65	81	52	55	8.2	5.7	58	49	75	144	110	111	100	2	53	6	69	54	*
Little Rock	257	51.1	32.4	92.7	71.1	62.4	75	110	-13	719	2982	5.16	2.81	47.38	18.04	T	9.58	2.0	4.6	13.0	80	65	66	83	55	61	8.3	6.3	61	45	74	137	108	120	105	1	58	10	54	40	*
Texarkana	361	56.3	35.5	94.6	71.1	65.1	12	106	-3	600	2362	5.30	2.79	50.59	15.33	.04	6.55	1.6	1.8	4.5	86	67	71	88	55	57	---	---	--	--	--	126	104	135	98	1	66	17	86	38	*
CALIFORNIA							70	134	-45																																
Bakersfield	489	57.3	36.5	101.1	67.3	65.0	48	118	13	561	2115	1 12	.01	6.36	4.61	.00	1.68	T	.1	4.0	85	70	58	47	29	18	5.0	7.0	--	--	--	206	86	73	34	*	2	20	114	25	0
Bishop	4108	53.6	22.2	96.9	54.1	56.0	19	109	-15	840	4222	1.12	.10	5.38	9.67	.00	3.34	5.0	12.6	9.0	--	45	36	--	19	15	---	---	--	--	--	196	89	80	27	3	13	*	104	147	*
Blue Canyon	5280	43.8	28.5	77.7	57.9	50.1	11	93	5	893	5719	9.47	.03	53.51	26.75	.00	8.66	52.7	249.2	38.5	--	67	73	--	28	29	---	---	--	--	--	174	67	124	87	41	12	70	*	106	0
Burbank	699	65.2	39.9	87.3	59.0	62.8	23	111	21	396	1808	3.06	T	13.88	13.84	.00	7.76	.4	.5	4.7	71	55	47	83	50	41	4.3	5.6	--	--	--	188	104	73	40	*	4	36	47	5	0
Eureka CO	43	53.6	40.8	60.6	52.2	52.3	68	85	20	552	4632	6.20	.09	36.15	19.49	.00	5.83	.2	.4	3.4	86	--	78	91	--	79	6.7	6.8	56	39	50	85	112	168	121	*	3	49	0	4	0
Fresno	331	53.5	35.9	100.1	64.1	63.0	67	115	17	629	2532	1.66	T	9.31	7.92	.00	2.86	.1	.1	2.5	90	73	67	52	28	16	5.4	7.8	54	47	97	222	71	72	44	*	4	31	99	15	0
Los Angeles CO	312	64.6	45.4	83.2	61.7	63.9	77	109	28	328	1451	3.37	T	14.54	15.80	.00	7.36	T	T	2.0	65	N45	58	87	N52	58	6.4	5.8	49	70	78	181	124	60	39	*	5	23	14	*	0
Los Angeles	99	63.3	43.0	74.4	60 8	60.9	--	---	--	378	2015	2.75	T	12.37	-----	---	----	---	---	---	--	--	--	--	--	--	---	---	--	--	--	---	---	---	---	--	--	--	---	---	--
Mt. Shasta CO	3544	41.4	24.1	84.8	49.5	49.3	41	101	-8	998	5913	5.39	.13	33.71	21.73	.00	4.70	34.6	102.4	37.4	85	78	77	69	36	28	---	---	--	--	--	162	94	109	93	20	13	9	20	143	*
Oakland	3	56.0	38.4	72.0	53.4	56.5	26	102	23	552	3163	3.42	.01	17.63	8.78	.00	3.21	T	T	1.0	85	73	68	88	69	62	5.9	8.2	--	--	--	139	123	103	65	*	2	19	4	7	0
Red Bluff	341	53.3	36.9	98.9	67.4	63.2	76	115	17	617	2546	4.23	.02	21.57	20.71	.00	6.12	1.8	3.0	11.4	84	70	66	50	29	18	6.6	5.6	63	48	95	214	71	80	71	1	5	8	89	16	0
Sacramento CO	25	52.1	38.3	92.0	58.6	60.9	77	114	17	614	2600	3.31	T	16.32	15.04	.00	7.24	.2	.2	4.0	a90	a81	a69	a77	a46	a28	7.3	8.3	70	44	96	225	72	68	57	*	4	20	50	9	0
San Diego	19	64.3	45.5	75.5	63.1	62.4	83	110	25	317	1574	2.57	.01	10.86	9.26	.00	3.62	T	T	.3	73	58	66	87	68	72	5.7	6.8	53	68	67	176	113	76	45	0	3	23	1	*	0
San Francisco CO	52	55.4	44.8	64.4	53.4	56.7	83	101	27	462	3069	4.07	.01	20.51	24.36	.00	4.67	T	.2	3.7	85	N68	71	91	N71	75	7.4	11.5	51	53	68	154	116	95	68	*	2	15	1	*	0
San Francisco	1	55.8	39.9	69.2	51.5	55.6	27	104	20	530	3421	3.59	.01	17.43	11.17	.00	2.37	T	T	T	86	77	69	90	71	69	6.9	14.1	62	--	--	161	108	96	62	0	2	22	3	8	0
Sandberg CO	4517	46.0	33.6	85.1	62.7	55.3	22	102	3	781	4243	2.85	.02	12.42	11.12	.00	4.09	9.0	25.7	38.5	61	58	58	--	25	26	17.9	13.2	--	--	--	210	83	72	41	5	5	86	21	56	0
Santa Maria	238	62.7	38.0	72.6	51.7	57.1	12	104	22	453	2934	2.71	.03	13.48	5.88	T	2.55	T	T	T	81	61	62	94	66	64	8.3	6.0	--	--	--	173	115	77	47	0	*	86	3	15	0
COLORADO							67	118	-60																																
Alamosa	7538	36.3	-2.5	81.3	46.8	41.4	9	91	-50	1491	8659	1.10	.17	6.23	1.77	T	1.33	4.4	23.9	6.8	76	59	59	84	38	38	---	---	--	--	--	150	140	75	62	13	49	13	2	227	44
Colorado Springs	6173	40.9	16.6	84.8	57.6	49.1	6	100	-27	1122	6254	2.72	.22	14.26	4.62	T	3.09	3.8	24.3	5.6	51	39	44	70	35	42	11.4	10.2	90	--	--	145	118	102	83	9	60	18	13	159	7
Denver	5292	41.7	15.6	87.2	58.3	49.8	83	105	-29	1125	6132	2.20	.50	14.20	8.57	.00	6.53	6.1	55.9	23.0	58	42	46	64	30	33	7.7	7.0	65	67	68	142	152	71	86	17	43	4	23	139	8
Grand Junction	4849	33.8	14.1	92.5	63.8	52.1	63	105	-21	1271	5796	1.20	.45	9.06	3.78	.00	2.50	5.6	21.3	17.0	77	61	60	49	28	23	4.3	6.7	66	58	75	158	117	90	74	7	40	3	50	132	5
Pueblo	4639	44.9	13.8	89.8	59.9	51.5	66	105	-31	1104	5709	1 81	.38	11.87	8.13	.00	2.93	4.2	28.8	16.3	66	44	48	68	32	35	8.0	7.8	80	75	75	157	144	64	68	9	42	4	44	148	8
CONNECTICUT							67	105	-32																																
Bridgeport	7	36.6	21.8	81.6	63.9	50.5	54	102	-20	1110	5896	4.43	2.83	42.01	18.77	.09	4.07	9.0	35.4	13.8	78	66	72	77	57	71	9.9	7.5	62	--	--	103	106	156	120	6	25	30	8	95	0
Hartford	169	36.1	17.9	85.6	62.0	50.1	50	101	-24	1178	6068	3.81	2.57	40.48	14.59	.18	6.72	10.8	39.8	19.0	74	62	67	78	55	70	8.7	7.4	70	46	62	107	111	147	127	10	28	45	10	119	3
New Haven	6	37.0	21.2	80.1	62.3	49.7	82	101	-15	1113	6026	4.12	3 00	44.99	17.08	.12	8.73	9.7	37.5	28.0	75	65	69	77	64	74	9.2	7.1	62	52	65	124	117	124	130	11	24	27	5	107	2
DELAWARE							62	110	-17																																
Wilmington	73	41.8	24.7	86.7	65.0	54.2	7	102	2	983	4910	5.28	2.98	44.50	7.40	.44	6.24	5.9	16.4	11.9	78	63	72	79	52	69	8.6	7.1	--	--	--	96	106	163	126	4	33	49	24	99	0
DIST. OF COLUMBIA																																									
Washington CO	72	44.0	28.9	87.1	68.4	56.8	83	106	-15	884	4258	4.49	2.64	41.44	17.45	.14	7.31	6.1	19.7	25.0	73	56	64	78	52	68	7.7	5.8	62	46	64	125	119	121	124	6	33	12	27	82	*
Washington	14	43.8	28.5	86.1	68.4	56.5	13	103	1	893	4333	4.75	2.44	40.48	11.61	.26	5.31	4.6	13.3	8.2	74	58	63	77	52	64	10.9	8.5	78	41	68	101	105	159	117	5	32	17	29	72	0
FLORIDA							65	109	-2																																
Apalachicola CO	13	62.2	48.1	87.4	75.1	68.8	32	102	18	352	1307	7.65	2.45	56.03	27.73	.01	11.71	T	T	.2	87	70	80	84	72	76	8.3	6.7	67	58	64	138	114	113	107	0	76	24	22	4	0
Daytona Beach	31	69.3	49.6	89.8	71.7	70.5	20	102	18	245	868	7.11	2.10	51.07	19.89	.04	9.29	.0	T	T	92	61	83	91	68	83	9.2	7.7	59	--	--	87	158	120	121	0	91	32	65	4	0
Fort Myers	15	75.2	53.9	90.5	73.4	73.9	35	101	Z29	124	405	9.20	1.21	53.27	Z20.25	.00	10.85	.0	T	T	93	56	79	87	63	83	7.8	6.9	E90	--	--	106	156	103	120	0	97	18	103	*	0
Jacksonville CO	18	65.9	48.7	89.6	73.7	69.8	83	104	10	303	1113	7.89	1.57	52.30	23.32	T	9.86	T	T	1.9	89	56	76	85	57	76	8.8	8.3	76	57	62	122	141	102	122	*	74	35	60	5	0
Jacksonville	24	66.3	45.4	91.4	72.7	69.3	--	---	---	331	1243	7.64	1.62	52.08	-----	----	-----	---	---	----	--	--	--	--	--	--	---	---	--	--	--	---	---	---	---	--	--	--	---	--	-
Key West CO	9	75.8	65.8	89.1	78.3	77.6	60	95	43	28	77	6.78	1.54	39.52	23.56	T	19.88	.0	T	T	84	69	79	77	68	74	10.3	8.3	91	66	68	140	157	68	111	0	59	*	26	0	0
Lakeland CO	214	71.5	52.5	90.2	72.2	72.2	40	101	23	185	649	8.16	1.39	51.43	15.57	.00	10.12	.0	T	T	--	--	--	--	--	--	6.9	5.4	--	65	46	120	148	97	114	0	101	16	91	*	0
Miami CO	8	74.4	62.6	86.8	76.4	75.3	44	95	27	57	173	7.88	1.73	47.20	25.34	T	15.10	.0	T	T	87	59	75	83	64	77	13.6	10.5	132	65	65	103	154	108	132	0	71	2	6	*	0
Miami	8	77.9	58.6	91.0	74.1	75.7	--	--	--	58	178	8.33	1.65	56.41	-----	----	-----	---	---	----	--	--	--	--	--	--	---	---	---	--	--	---	---	---	---	--	--	--	---	--	-
Miami Beach	9	75.5	64.4	87.6	77.4	76.6	13	98	35	43	123	7.07	1.75	42.90	18.02	.01	6.64	.0	.0	.0	--	--	--	--	--	--	---	---	---	--	--	183	89	93	125	0	--	--	11	0	0
Orlando	106	73.0	50.7	91.4	72.7	72.5	12	102	26	188	650	7.85	1.32	51.23	15.87	T	9.67	.0	T	T	91	55	74	90	60	80	8.3	7.8	---	--	--	101	150	114	119	0	87	27	110	1	0
Pensacola CO	13	61.1	46.9	86.9	75.0	68.0	75	103	7	383	1435	7.59	3.84	61.60	21.43	T	17.07	T	.1	2.1	--	--	--	--	--	--	10.6	9.1	114	55	66	132	123	110	112	*	72	16	19	8	0
Pensacola	118	----	----	----	----	----	--	---	--	---	----	----	----	-----	-----	----	-----	---	---	----	83	69	77	83	69	76	---	---	---	--	--	---	---	---	---	--	--	--	---	--	--
Tallahassee	64	65.2	42.0	91.0	71.0	67.7	15	103	15	385	1519	7.87	2.38	56.66	17.88	.02	7.07	.0	T	.2	88	58	74	90	64	77	6.2	4.6	---	--	--	105	131	129	115	0	77	37	86	19	0
Tampa	19	70.8	52.1	89.5	73.8	72.3	65	98	19	201	674	8.11	1.04	49.94	18.93	T	10.41	T	T	.1	87	60	74	83	62	78	8.4	7.1	84	63	61	119	157	89	114	0	86	21	64	1	0

See reference notes at end of table.

Table 10a - Continued

NORMALS, MEANS AND EXTREMES

State and Station	Elevation ground (feet)	Temperature (°F)								Normal degree days (1921-1950)		Precipitation (inches)									Relative humidity (percent)						Wind Speed (m.p.h.)			Sunshine (percent of possible)		Annual mean number of days									
		Normal (1921-1950)					Period Extremes					Normal (1921-1950)			Extremes			Snow, sleet, hail									Mean hourly					Sunrise to sunset							Temperature		
		January		July														Mean total		Ex-treme	January			July															Max.	Min.	
		Daily maximum	Daily minimum	Daily maximum	Daily minimum	Annual	Length, yrs.	Record highest	Record lowest	January	Seasonal	Wettest month	Driest month	Annual	Wettest month	Driest month	Maximum in 24 hours	January	Seasonal	Maximum in 24 hours	7:30 a.m. EST	1:30 p.m. EST	7:30 p.m. EST	7:30 a.m. EST	1:30 p.m. EST	7:30 p.m. EST	January	July	Fastest mile	January	July	Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet, hail 1.0 inch or more	Thunderstorms	Heavy fog	90° and above	32° and below	Zero and below
FLORIDA (Cont'd.)																																									
West Palm Beach	15	75.4	58.6	89.9	74.0	75.0	17	101	31	85	248	9.12	2.20	61.72	18.26	0.12	15.23	0.0	T	T	86	59	76	84	64	80	10.8	6.9	--	--	--	72	162	131	138	0	80	7	90	*	0
GEORGIA							63	112	-17																																
Athens	798	54.6	34.8	92.4	69.1	62.7	11	105	7	629	2800	5.17	2.94	49.94	14.98	.09	4.05	.5	1.0	5.0	--	--	--	--	--	--	----	---	--	--	--	106	111	148	116	0	48	--	56	47	0
Atlanta	975	53.3	35.9	89.4	69.6	62.2	76	103	-9	632	2826	5.67	2.60	49.16	15.82	.02	7.36	.9	2.2	8.3	80	64	69	83	57	67	11.5	7.8	70	48	62	126	111	128	123	1	51	21	33	38	*
Augusta	143	58.3	39.1	91.5	71.4	65.4	81	106	3	521	2138	5.21	2.44	43 17	14.00	T	9.82	.2	.8	10.5	84	59	69	83	55	69	5.7	4.8	48	56	67	136	120	109	112	*	42	10	64	27	0
Columbus	385	58.1	36.7	91.0	70.7	64.2	9	104	10	563	2396	5.92	2.04	49.00	12.53	.30	5.31	T	T	T	87	62	75	87	59	70	----	---	--	--	--	119	103	143	113	0	62	19	78	41	0
Macon	356	60.4	38.6	93.3	71.5	66.1	55	106	7	497	2049	5.34	2.27	46.31	20.52	T	8.36	.2	.6	6.9	83	57	64	83	56	68	6.9	5.4	65	55	67	127	109	129	113	1	60	12	63	31	0
Rome	637	53.6	31.8	92.2	67.7	61.3	9	106	3	700	3138	5.83	2.86	52.96	17.37	.36	7.53	.3	.8	2.0	--	--	--	--	--	--	----	---	--	--	--	100	125	140	125	0	63	24	66	75	0
Savannah	48	62.2	42.0	90.5	72.2	66 8	84	105	8	424	1710	7.09	1.51	45.75	22.88	T	11.44	T	T	2.0	83	59	72	85	61	80	9.5	8.1	90	53	60	129	128	108	115	*	53	16	52	10	0
IDAHO							62	118	-60																																
Boise	2842	34.6	19.9	90.5	59.1	50.8	15	109	-17	1169	5890	1.35	.18	11.48	4.00	.00	1.51	6.5	21.3	13.0	82	75	74	53	33	22	9.2	9.0	61	40	88	122	99	144	90	8	18	17	39	125	2
Idaho Falls 46W CO	4933	27.6	3.8	88.1	50.3	42.3	5	99	-26	1528	8556	1.02	.36	7.69	2.74	.00	1.73	6.1	24.3	6.5	--	--	--	--	--	--	8.4	7.9	44	--	--	---	---	---	65	14	10	--	23	215	31
Idaho Falls 43NW CO	4780	25.3	-0.7	87.9	48.3	41.1	4	102	-26	1634	8925	1.08	.31	7.35	1.81	.00	1.33	1.8	13.6	7.0	--	--	--	--	--	--	6.6	7.6	41	--	--	---	---	---	63	2	--	--	28	217	38
Lewiston	1413	37.2	24.4	90.1	60.2	52.1	8	105	-22	1060	5483	1.75	.38	13.12	4.80	T	1.63	6.3	13.4	11.9	77	71	70	62	36	24	6.5	5.7	--	--	--	96	81	188	104	5	17	15	33	101	3
Pocatello	4444	31.0	13.0	89.4	55.9	47.2	16	103	-31	1333	6976	1.21	.72	12.44	3.80	.00	1.65	9.5	37.4	10.1	81	75	74	56	29	21	9.7	9.1	61	36	81	112	104	149	93	14	27	9	30	160	9
ILLINOIS							65	117	-35																																
Cairo CO	314	44.9	29.8	90.7	71.7	59.8	83	106	-16	856	3756	4.72	2.60	43.65	15.70	.01	7.56	3.5	9.8	17.0	81	68	--	82	59	--	9.8	6.4	62	46	81	112	120	133	114	3	58	6	36	63	1
Chicago	610	32.7	17.1	85.3	63.9	50.1	84	105	-23	1243	6310	4.15	1.41	32.72	12.06	.06	6.19	8.7	33 9	14.9	80	71	75	76	56	61	11.7	8.7	87	44	73	113	120	132	124	10	37	11	13	110	8
Moline	589	31.9	14.4	87.2	63.7	50.2	22	106	-23	1296	6364	4.63	1.17	33.10	10.35	.04	4.89	5.7	23.9	9.6	80	69	76	83	53	56	10.5	7.2	77	43	75	103	101	161	110	9	47	20	32	138	10
Peoria	654	33.3	16.7	87.0	64.4	51.0	99	113	-27	1240	6087	3.94	1.91	35.18	12.30	.04	5.52	5.9	21.5	18.0	83	72	78	81	53	58	8.8	5.6	75	47	76	142	105	118	113	7	50	12	30	125	8
Springfield	589	35.3	19.4	87.4	65.2	52.4	76	112	-24	1166	5693	4.19	1.62	36.65	15.16	.02	5.94	5.1	19 4	15.0	85	73	79	85	53	57	12.5	9.2	68	47	77	119	114	132	112	4	47	9	32	103	4
INDIANA							68	116	-35																																
Evansville	383	43.4	26.0	89.1	67.3	56.9	58	108	-23	939	4360	4.29	2.82	41.37	14.78	.01	6.94	4.6	14.4	20.0	82	68	73	78	51	57	9.8	6.8	113	43	78	113	130	122	113	4	50	11	41	79	1
Fort Wayne	801	33.4	19.1	84.3	62.6	49.9	43	106	-24	1200	6287	3.56	1.77	34.21	10.09	.20	4.93	7.7	26.9	12.4	85	74	80	78	51	57	10.5	7.5	65	38	74	95	114	156	128	8	42	12	18	124	6
Indianapolis	793	37.1	20.5	87.9	64.1	52.5	84	107	-25	1122	5611	4.21	2.08	39.69	13.12	.11	6 80	5.4	20.3	12.1	83	68	74	72	48	56	11.4	8.7	111	40	74	100	122	143	130	6	46	20	19	99	4
South Bend	768	31.9	17.2	84.6	62.1	49.1	61	109	-22	1252	6524	3.84	1.56	35.59	9.75	.02	3.50	11.5	48.1	12.5	84	76	81	83	52	58	12.5	8.3	---	--	--	75	109	181	131	17	44	22	20	138	7
IOWA							82	118	-47																																
Burlington	694	32.5	15.5	88.0	65.5	51.3	57	111	-27	1271	6101	5.64	1 41	36.61	15.10	.08	6.28	6.8	25.0	13.0	81	71	76	84	55	58	11.2	7.9	73	49	77	173	77	115	103	10	56	19	36	127	10
Davenport	568	32.0	16.5	87.3	67.2	51.4	82	111	-27	1262	6091	4.79	1.31	34.27	12.68	.01	6.57	7.2	26.8	11.2	--	--	--	--	--	--	----	---	---	--	--	---	---	---	112	9	42	7	22	122	11
Des Moines	948	30.8	13.3	86.8	65 6	50.2	76	110	-30	1330	6446	4.99	1.08	30.74	15.79	.03	5.37	8.6	32.0	17.7	78	70	72	84	56	55	10.6	8.4	76	56	74	119	116	130	107	10	46	6	25	129	14
Dubuque	1065	27.2	11.6	83.2	63.3	47.0	80	110	-32	1414	7271	5.09	1.11	32.85	14.16	T	5.48	9.1	35 4	14.9	81	70	76	78	53	60	----	---	47	--	--	114	113	138	114	12	39	11	14	132	18
Sioux City	1094	28.9	9.2	88.4	64.2	48.6	65	111	-35	1423	7012	4.41	74	24.90	11.78	T	5.12	6.8	31.4	20.0	77	68	72	80	52	51	11.4	9.3	91	55	75	124	115	126	94	9	43	10	26	145	20
KANSAS							68	121	-40																																
Concordia CO	1375	37.6	18.6	91.2	68.7	54.5	69	116	-25	1144	5323	4.23	.59	25 40	13.74	T	6.46	4.0	20.1	17.2	78	63	69	76	46	48	7.7	7.1	65	60	78	142	129	94	87	6	46	12	48	118	7
Dodge City	2594	42.0	18.6	92.9	66.9	55.0	80	109	-26	1076	5058	3.01	.49	20.58	12.82	.00	6.03	3.6	19.1	17.5	79	56	62	76	41	44	10.9	11.2	78	67	78	171	117	77	76	6	39	14	57	123	5
Goodland	3645	39.3	12.3	90.9	60.2	49.9	34	111	-22	1215	6367	3.02	.31	18.21	8.09	.00	2.95	2.9	25.6	17.9	76	51	60	79	44	42	13.4	12.6	--	--	--	135	133	97	75	7	45	28	58	152	9
Topeka	926	38.9	20.8	91.8	69.4	55.9	68	114	-25	1088	4919	4.61	1.00	33.28	14 10	T	8.08	4.2	19.1	18.7	78	64	67	81	51	50	9.3	8.3	66	55	74	142	122	101	97	5	51	9	48	106	4
Wichita	1321	41.3	22.6	92.3	69.4	57.0	66	114	-22	1023	4571	4.99	.98	30.70	14.43	.00	7.99	3.2	13.7	12.3	78	63	66	78	48	49	12.5	11.5	100	61	80	157	113	95	87	4	51	11	52	95	2
KENTUCKY							67	114	-33																																
Lexington	979	40.5	24.5	86.2	65.2	54.4	71	108	-20	1008	4979	4 50	2.44	43.71	16.65	.11	8.06	6.1	19.5	13.4	82	74	74	78	56	65	13.6	8.8	56	36	64	127	106	132	132	6	44	11	25	91	2
Louisville CO	457	43.2	27.9	87.9	69.3	57.3	--	---	--	911	4279	4.67	2.48	41.60	-----	----	----	---	----	----	--	--	--	--	--	--	----	---	--	--	--	---	---	---	---	--	--	--	--	--	--
Louisville	474	43.6	26.2	89.1	66.6	56.5	82	107	-20	933	4439	4.67	2.45	41.47	19.17	.07	5.80	4.0	13.5	15.0	77	68	69	77	52	57	9.9	7.0	68	41	73	118	116	131	122	4	46	11	35	76	1
LOUISIANA							64	114	-16																																
Baton Rouge	64	61.3	43.4	90.0	72.2	67.5	10	103	13	424	1595	5.87	2.98	59.13	14.63	.08	8.40	.2	.2	1.8	89	65	71	91	60	71	----	---	--	--	--	108	133	124	111	*	73	31	92	15	0
Lake Charles	12	61.8	43.4	91.1	73.3	68.3	16	104	12	416	1543	6.93	3.44	57.82	17.90	T	16.01	.6	.6	3.4	90	68	77	93	63	72	11.7	7.0	55	--	--	98	120	147	109	*	73	38	86	12	0
New Orleans CO	9	63.5	48.3	90 3	75.8	70.4	81	102	7	341	1175	7.09	3.66	63.54	25.11	T	14.01	.1	.2	8.2	85	67	73	84	64	72	8.4	6.5	98	49	58	119	137	109	118	*	72	14	56	4	0
New Orleans	3	63.2	46.5	90.1	73.4	69.1	--	---	--	364	1317	5.90	3.18	59.65	-----	----	-----	---	---	---	--	--	--	--	--	--	----	---	--	--	--	---	---	---	---	--	--	--	--	--	--
Shreveport	252	56.4	39.2	93.4	73.8	66.4	81	110	-5	550	2117	4.72	2.22	45.10	25.45	T	12.44	.9	1.8	11.0	83	67	67	86	56	62	9.0	7.1	59	46	83	150	109	106	99	--	49	6	85	22	*
MAINE							67	105	-48																																
Caribou	624	18.1	-.8	74.5	53.5	37.2	16	96	-32	1745	10173	4.03	1.73	35.88	8.14	.12	6.23	20.6	99.3	18.2	74	69	73	82	58	71	12.8	9.1	--	--	--	55	107	203	154	30	21	26	3	193	44
Portland	61	30.7	10.6	78.7	56.9	44.5	83	103	-39	1373	7681	4.43	2.59	41.78	12.29	.09	7.49	19.3	70.9	23.3	76	64	70	79	60	77	8.9	7.4	76	54	65	130	105	130	134	17	25	57	4	136	6
MARYLAND							60	109	-40																																
Baltimore CO	14	43.6	29.6	86.9	70.0	57.1	81	107	-7	880	4203	4.38	2.95	42.59	-----	----	-----	----	----	----	--	--	--	--	--	--	----	----	--	--	--	---	---	---	---	--	--	--	--	---	--
Baltimore	146	42.8	25.6	86.6	66.0	54.7	--	---	---	955	4787	4.38	2.95	42.59	13 83	.05	7.62	5.9	21.7	24.5	74	60	66	77	54	64	10.3	8.8	80	48	66	121	123	121	124	6	32	17	24	72	*
Frederick	294	41.0	24.0	87.9	65.4	54.7	13	102	-8	1001	4854	4.03	2.58	40.23	11.26	.82	4.76	6.2	20.0	17.5	--	65	--	--	53	--	----	----	--	--	--	---	---	---	129	6	22	9	34	119	1
MASSACHUSETTS							67	106	-30																																
Blue Hill Obs	640	34.0	18.8	79.7	61.4	47.3	70	101	-21	----	----	4.20	3.45	46.28	11.67	.06	6.02	15.7	58.1	18.4	--	--	--	--	--	--	17.4	13.0	121	43	56	104	125	136	137	16	25	98	4	132	5
Boston	15	36.5	21.6	80.0	64.3	50.7	83	104	-18	1113	5791	3.50	2.79	38.76	13.38	T	6.04	12.0	42.1	16.5	72	59	67	72	55	70	12.6	10.0	87	47	64	114	115	136	126	11	19	15	10	102	2
Nantucket	43	39.3	24.8	73.8	60.3	48.8	68	95	-8	1020	6102	4.05	2.83	41.89	12.92	.01	5.73	7.1	26.2	20.1	81	73	80	85	74	90	14.8	11.7	91	43	63	112	108	145	133	6	18	86	*	87	*
Pittsfield	1153	29.8	12.5	79.0	56.1	44.5	18	95	-25	1358	7694	4.95	2.51	44.24	10.32	.60	4.25	18.7	70.3	10.9	--	--	--	--	--	--	----	----	--	--	--	57	127	181	158	21	28	45	2	164	12

See reference notes at end of table.

Table 10a - Continued

NORMALS, MEANS AND EXTREMES

State and Station	Elevation ground (feet)	Temperature (°F)								Normal degree days (1921-1950)		Precipitation (inches)									Relative humidity (percent)						Wind Speed (m.p.h.)			Sunshine (percent of possible)		Annual mean number of days									
		Normal (1921-1950)					Period Extremes					Normal (1921-1950)			Extremes			Snow, sleet, hail									Mean hourly					Sunrise to sunset							Temperature		
		January		July														Mean total		Extreme	January			July															Max.	Min.	
		Daily maximum	Daily minimum	Daily maximum	Daily minimum	Annual	Length, yrs.	Record highest	Record lowest	January	Seasonal	Wettest month	Driest month	Annual	Wettest month	Driest month	Maximum in 24 hours	January	Seasonal	Maximum in 24 hours	7:30 a.m. EST	1:30 p.m. EST	7:30 p.m. EST	7:30 a.m. EST	1:30 p.m. EST	7:30 p.m. EST	January	July	Fastest mile	January	July	Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet, hail 1.0 inch or more	Thunderstorms	Heavy fog	90° and above	32° and below	Zero and below
MICHIGAN							67	112	-51																																
Alpena CO	587	28.1	14.2	76.8	57.9	43.5	82	104	-28	1358	8073	3.20	1.45	26.63	13.18	0.10	4.40	16.9	66.7	16.8	80	70	77	77	61	69	11.0	9.0	61	28	70	85	126	154	148	20	25	14	3	158	14
Detroit	619	33.1	19.3	83.5	62.6	49.3	84	105	-24	1203	6404	3.61	2.02	31.03	8.76	.04	4.75	10.1	39.4	24.5	81	72	78	73	50	59	11.8	9.0	95	34	69	96	123	146	137	13	32	11	10	125	4
Detroit Willow Run	722	32.1	18.5	84.3	62.6	49.2	8	100	-13	1231	6469	3.44	1.74	30.16	8.71	.42	4.78	9.5	32.1	8.0	80	72	76	77	48	54	11.7	8.7	60	--	--	80	102	183	126	12	36	29	18	133	3
East Lansing CO	856	30.9	16.6	82.4	59.7	47.3	55	102	-25	1277	6982	3.75	1.81	31.08	9.21	.04	5.47	11.1	47.4	18.1	82	74	78	80	51	57	11.0	7.4	72	32	73	94	109	162	143	13	38	13	10	144	7
Escanaba CO	594	25.0	10.0	75.3	58.4	41.9	81	100	-32	1473	8657	3.22	1.37	27.08	12.06	.07	5.05	13.5	57.9	18.5	79	70	75	80	66	69	9.7	8.5	68	39	65	103	112	150	130	17	33	17	1	165	23
Grand Rapids CO	638	31.8	19.7	84.0	63.2	49.3	63	108	-24	1215	6474	3.47	1.67	31.35	13.22	.02	4.58	15.1	56.6	14.0	--	--	--	--	--	--	----	---	--	--	--	---	---	---	135	20	39	7	13	129	2
Grand Rapids	681	30.7	16.3	83.6	59.4	47.1	--	---	--	1287	7075	3.45	1.67	31.50	-----	----	----	----	----	----	85	78	80	76	50	54	12.0	8.8	80	26	72	81	109	175	---	--	--	--	--	---	--
Marquette CO	677	25.2	12.1	75.1	57.1	42.2	80	108	-27	1435	8529	3.46	1.72	31.24	12.73	.12	5.14	23.1	109.6	17.0	76	72	74	74	65	69	10.6	8.1	91	31	63	72	118	175	160	30	25	12	4	161	13
Muskegon	627	31.4	18.3	80.5	59.2	46.8	13	97	-14	1243	7089	3.34	1.64	29.01	7.12	.33	3.51	19.7	65.8	12.5	83	77	79	83	57	60	----	---	--	--	--	79	93	193	141	23	36	25	6	146	2
Sault Ste. Marie	721	21.9	5.7	75.4	52.4	39.3	66	98	-37	1587	9475	3.49	1.52	30.19	9.35	.09	5.64	19.4	83.2	14.3	78	75	79	84	61	70	9.0	7.2	72	28	63	79	99	187	160	29	24	23	2	170	29
MINNESOTA							68	114	-59																																
Duluth	1162	18.7	1.9	75.8	55.8	39.2	80	106	-41	1696	9574	3.72	1.00	26.63	11.52	.07	5.35	11.0	55.1	23.0	78	74	74	87	61	66	12.7	10.1	75	46	68	110	119	136	126	16	31	37	2	172	41
International Falls	1179	13.6	-7.7	78.6	53.0	36.3	15	97	-41	1922	10600	3.73	.85	24.17	11.26	.10	4.82	10.5	58.6	13.9	76	70	73	88	57	59	----	---	--	--	--	83	107	175	136	18	28	10	4	199	64
Minneapolis	830	23.1	6.1	84.9	63.3	45.6	64	108	-34	1562	7853	4.26	.80	24.71	11.87	T	7.80	8.9	42.3	16.2	76	67	72	79	51	54	11.2	9.7	92	49	72	105	113	147	107	15	39	8	15	150	30
Rochester	1017	23.5	5.1	84.2	59.4	44.5	42	108	-42	1572	8095	4.33	.75	28.48	11.95	T	5.26	8.9	41.0	12.9	77	70	74	84	55	58	10.2	7.5	--	--	--	92	128	145	103	13	41	18	13	168	30
St. Cloud	1034	20.7	.2	83.2	58.0	41.9	61	107	-42	1690	8893	3.85	.69	24.16	12.81	.00	5.00	8.2	38.0	12.2	77	74	74	85	55	57	8.3	7.2	--	--	--	124	100	141	109	13	35	21	11	179	41
MISSISSIPPI							67	115	-16																																
Jackson	315	58.6	37.9	93.6	70.5	65.4	59	107	-5	535	2202	6.23	2.10	50.86	15.76	.00	7.50	1.1	1.6	11.7	88	65	71	90	54	63	10.1	6.3	68	40	63	112	135	118	102	*	63	18	99	36	*
Meridian	294	58.5	36.5	92.0	69.8	64.5	65	105	-7	561	2333	6.58	2.38	55.07	20.06	T	9.50	.7	1.3	7.6	86	60	69	87	56	69	6.4	4.6	47	--	--	136	119	110	110	*	61	8	65	35	*
Vicksburg CO	234	57.6	40.8	90.0	72.9	66.1	81	104	-1	507	2000	6.03	1.77	49.63	22.24	T	9.97	1.0	1.7	10.0	82	65	67	87	61	70	8.5	6.4	49	46	69	130	121	114	108	*	62	9	61	19	*
MISSOURI							67	118	-40																																
Columbia	778	38.8	20.7	88.8	66.8	54.6	65	113	-26	1091	5113	4.90	1.57	39.33	14.86	.06	6.61	4.6	19.7	12.8	79	66	69	83	54	55	8.7	6.0	63	52	75	134	108	123	110	6	59	7	40	104	5
Kansas City	741	39.0	21.0	91.2	70.5	56.1	66	113	-22	1085	4888	5.02	1.16	35.31	16.17	.04	7.03	4.6	20.5	25.0	78	64	69	76	49	53	10.2	8.8	72	55	76	141	114	110	104	5	55	10	39	96	4
St. Joseph	809	36.9	17.3	91.4	68.8	54.5	45	110	-24	1175	5336	6.46	1.01	35.28	15.71	T	6.89	4.6	19.1	12.4	78	64	70	79	51	52	9.4	7.3	--	54	77	---	---	---	100	4	54	22	44	109	5
St. Louis CO	465	41.0	25.6	89.6	71.6	57.3	84	112	-22	983	4469	4.10	1.88	37.86	20.45	.00	8.78	4.2	17.3	20.4	77	65	68	73	50	55	11.9	9.3	91	48	72	137	116	112	112	5	49	10	36	80	2
St. Louis	552	40.8	23.6	90.0	69.3	56.3	--	---	--	1017	4699	4.37	1.66	36.73	-----	----	----	----	----	----	--	--	--	--	--	--	----	---	--	--	--	---	---	---	---	--	--	--	--	---	--
Springfield	1265	41.7	23.7	87.7	67.2	55.7	67	113	-29	1001	4693	5.56	1.76	41.51	16.15	.05	6.55	4.5	16.9	20.0	82	69	72	81	57	59	11.1	8.4	70	48	77	161	101	103	112	4	59	11	27	86	3
MONTANA							88	117	-70																																
Billings	3568	32.3	13.4	87.9	58.6	47.2	20	106	-38	1305	7106	2.61	.44	13.10	7.64	T	2.83	7.4	48.8	16.6	67	63	61	65	40	32	12.8	9.8	73	47	79	88	126	151	91	18	30	20	28	149	17
Glasgow CO	2090	22.8	-1.4	88.4	57.2	42.7	11	108	-50	1683	8690	3.48	.34	13.26	6.95	T	2.83	7.8	37.4	8.0	71	66	69	74	38	33	----	---	--	--	--	84	106	175	95	13	28	12	29	185	47
Great Falls	3664	31.7	13.6	83.8	55.3	45.1	17	105	-35	1311	7555	2.96	.55	14.03	8.13	T	3.20	7.6	50.9	11.0	67	63	62	64	36	31	17.6	11.2	73	48	81	85	111	169	96	19	29	13	15	144	22
Havre CO	2488	26.3	6.1	85.9	56.6	43.6	75	108	-57	1513	8213	2.98	.39	12.31	9.67	T	3.71	7.0	36.3	24.8	82	71	78	74	37	35	9.4	7.5	59	49	78	126	132	107	90	13	23	6	19	171	40
Helena	3893	27.7	7.5	83.8	52.2	43.0	75	103	-42	1469	8250	2.15	.41	11.30	6.67	T	3.67	10.0	53.3	14.6	68	64	64	64	37	33	7.3	8.1	73	46	77	98	123	144	99	18	31	3	9	156	21
Kalispell	2965	28.0	12.6	82.1	49.9	43.2	5	97	-38	1386	8055	2.43	.92	16.35	3.56	.02	1.74	21.6	64.7	15.4	--	76	--	--	40	--	9.1	7.2	--	--	--	75	81	209	130	24	25	38	6	180	13
Miles City	2629	26.6	5.5	89.9	60.0	45.4	63	111	-49	1516	7850	2.84	.36	12.81	9.78	.00	3.74	6.1	31.9	28.0	84	73	77	70	35	38	5.9	6.1	--	52	80	140	128	97	89	12	23	2	34	163	31
Missoula	3200	28.6	10.1	86.3	50.4	44.1	19	105	-26	1414	7873	1.87	.78	12.76	4.10	.04	1.69	9.4	39.8	22.8	84	79	77	77	40	28	5.6	6.6	57	30	79	83	90	192	119	13	27	15	21	161	10
NEBRASKA							79	118	-47																																
Grand Island	1841	34.0	11.9	92.9	64.9	51.0	24	117	-26	1302	6311	3.87	.55	22.70	10.43	.00	5.41	6.3	26.9	8.6	79	61	69	81	49	48	11.3	11.3	--	--	--	136	109	120	80	10	48	16	57	148	14
Lincoln CO	1184	34.3	15.7	90.5	67.8	52.7	68	115	-29	1240	5865	4.10	.82	25.73	14.21	.00	8.38	5.7	26.3	12.4	--	--	--	--	--	--	10.4	9.2	66	57	76	131	112	122	95	--	47	5	40	129	11
Norfolk	1544	29.4	9.2	88.7	63.7	48.3	9	113	-26	1417	7065	4.78	.78	25.69	9.11	T	3.46	4.6	27.3	7.4	80	65	72	83	54	51	----	---	--	--	--	123	104	138	89	8	51	10	35	157	18
North Platte	2779	36.8	11.2	89.4	62.2	49.5	80	112	-35	1271	6546	2.92	.34	17.54	10.47	T	6.32	3.8	25.2	13.0	83	61	62	84	50	47	8.0	8.1	72	63	78	146	129	90	83	8	38	8	33	158	15
Omaha	978	32.4	13.5	89.3	67.6	51.6	82	114	-32	1302	6160	4.51	.81	25.90	12.70	T	7.03	6.6	28.2	16.4	80	66	69	76	51	53	9.7	8.1	109	56	75	132	118	115	98	9	41	9	30	123	14
Scottsbluff	3950	36.7	10.3	90.1	59.0	48.2	63	110	-45	1287	6841	2.78	.33	15.00	8.33	.00	3.74	4.8	34.0	17.6	68	47	52	78	41	39	9.5	9.1	80	--	--	208	89	68	72	12	45	12	46	179	16
Valentine CO	2581	32.8	9.3	88.3	62.2	47.9	66	110	-38	1361	7075	3.16	.46	18.23	8.18	.00	4.21	6.1	38.3	16.0	--	--	--	--	--	--	9.2	9.2	62	62	79	137	127	101	93	--	38	--	32	164	22
NEVADA							66	122	-50																																
Elko	5075	34.5	9.2	91.3	49.1	45.7	59	107	-43	1336	7335	1.07	.29	9.13	6.00	.00	3.30	10.6	36.3	16.7	71	69	79	26	20	40	6.6	6.5	--	--	--	157	94	114	53	13	22	3	43	213	18
Ely	6257	37.4	8.6	88.6	48.1	45.2	16	99	-27	1302	7443	1.29	.50	10.52	2.63	.00	1.22	8.3	41.3	13.1	76	57	57	56	25	26	11.1	11.0	74	62	78	136	108	121	69	14	31	*	13	217	22
Las Vegas	2162	55.4	33.0	105.4	75.6	66.8	18	117	8	653	2425	.58	.13	4.35	3.39	.00	1.75	1.1	1.3	5.0	61	42	34	31	19	14	6.2	8.3	--	75	84	207	86	72	25	*	14	*	141	58	0
Reno	4397	45.7	16.6	91.8	47.3	49.5	67	106	-19	1048	6036	1.05	.22	6.96	6.76	.00	2.71	9.0	28.6	22.5	77	67	56	62	25	20	6.0	7.2	72	58	90	196	98	71	49	8	15	4	34	158	3
Winnemucca	4299	37.4	18.2	92.0	56.4	49.1	74	108	-36	1153	6369	1.01	.18	8.75	5.23	.00	1.64	7.7	27.7	18.2	84	66	65	48	20	17	8.2	7.5	69	53	90	169	96	100	71	8	12	1	41	172	7
NEW HAMPSHIRE							79	106	-46																																
Concord	339	31.6	8.6	82.6	55.3	44.8	84	102	-37	1392	7612	3.62	2.30	37.23	10.97	T	5.97	18.0	68.3	19.0	78	59	69	80	49	69	6.1	4.9	72	48	56	139	106	120	120	19	24	53	9	154	15
Mt. Washington	6262	14.1	-3.3	55.1	43.4	27.0	22	71	-46	1789	13625	6.58	4.75	70.25	15.57	.75	4.71	26.1	178.9	32.0	b75	b78	b77	b92	b87	b90	48.9	25.4	150	32	30	52	77	236	203	56	15	302	0	242	64
NEW JERSEY							70	110	-34																																
Atlantic City CO	8	42.4	29.1	79.3	67.9	54.1	81	104	-9	905	4741	4.72	2.98	41.77	14.87	.01	9.21	4.0	14.3	18.0	79	68	74	81	72	82	16.2	13.3	91	52	67	122	120	123	122	5	22	21	3	76	*
Newark	11	39.0	24.0	84.9	65.6	52.9	24	105	-14	1039	5252	4.20	3.10	42.96	10.28	.07	4.59	6.6	24.0	26.0	72	60	66	75	51	65	11.1	8.5	82	--	--	92	120	153	120	6	26	28	23	98	*
Trenton CO	56	39.8	25.4	84.6	66.0	53.5	82	106	-14	1004	5068	4.59	2.65	40.06	15.22	.06	5.42	6.3	23.2	16.0	73	N62	68	77	N55	68	10.5	8.4	73	48	67	105	114	146	114	6	35	22	16	93	*
NEW MEXICO							63	116	-50																																
Albuquerque	5310	45.6	21.8	91.6	66.4	56.6	23	102	-6	970	4389	1.43	.28	8.68	3.81	.00	2.18	2.0	8.7	6.8	70	49	46	61	33	30	7.9	8.9	90	71	77	175	117	73	60	4	47	4	62	117	*
Clayton	4969	46.7	19.0	88.4	59.8	53.1	40	105	-18	995	5138	2.59	.27	15.42	10.51	.00	6.20	---	---	7.5	65	44	50	76	41	42	---	---	--	--	--	---	---	---	---	--	--	--	---	---	--
Roswell	3612	53.8	25.3	92.1	65.8	59.8	60	110	-29	787	3424	2.00	.39	12.07	9.56	.00	5.65	2.7	10.1	11.0	70	45	41	73	37	34	7.8	7.4	75	69	76	190	117	58	54	3	45	6	77	98	1

See reference notes at end of table.

Table 10a - Continued

NORMALS, MEANS AND EXTREMES

State and Station	Elevation ground (feet)	Temperature (°F)								Normal degree days (1921-1950)		Precipitation (inches)									Relative humidity (percent)						Wind Speed (m.p.h.)			Sunshine (percent of possible)		Annual mean number of days									
		Normal (1921-1950)					Period Extremes					Normal (1921-1950)			Extremes			Snow, sleet, hail			January			July			Mean hourly					Sunrise to sunset							Temperature		
		January		July														Mean total		Extreme																			Max.	Min.	
		Daily maximum	Daily minimum	Daily maximum	Daily minimum	Annual	Length, yrs.	Record highest	Record lowest	January	Seasonal	Wettest month	Driest month	Annual	Wettest month	Driest month	Maximum in 24 hours	January	Seasonal	Maximum in 24 hours	7:30 a.m. EST	1:30 p.m. EST	7:30 p.m. EST	7:30 a.m. EST	1:30 p.m. EST	7:30 p.m. EST	January	July	Fastest mile	January	July	Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet, hail 1.0 inch or more	Thunderstorms	Heavy fog	90° and above	32° and below	Zero and below
NEW YORK							65	108	-52																																
Albany	277	30.9	14.0	82.5	60.2	47.2	81	104	-26	1318	6962	3.37	2.03	31.82	13.48	0.08	4.75	13.0	50.2	30.4	75	63	71	79	52	64	10.1	7.3	71	41	63	104	125	136	137	12	23	17	9	129	9
Binghamton	858	34.0	17.3	82.8	60.0	48.4	64	103	-28	1218	6556	3.69	2.24	36.26	9 51	.16	4.55	12.1	50.1	21.0	82	68	77	86	56	71	6.9	4.7	72	31	54	68	108	189	152	14	31	27	9	130	7
Buffalo	693	32.4	18.5	81.1	60.0	47.5	81	99	-21	1225	6838	3.09	2.43	32.29	10.63	.05	4.28	18.7	74.3	24.3	79	72	78	78	53	63	17.6	12.1	91	31	70	74	128	163	164	22	29	13	2	128	3
New York CO	10	39.9	25.8	82.3	66.9	53 4	84	102	-14	995	5050	4.34	3.04	42.03	14.51	.11	9.40	7.6	30.4	15.8	72	62	66	76	58	68	16.5	12.1	113	51	65	105	130	130	126	8	30	21	7	91	*
New York, Central Pk.	132	39.2	26.1	84.7	67 4	54.0	86	106	-15	1001	4965	4.40	3.03	43.36	16.85	02	5.41	7.9	29.8	26 4	68	62	62	75	56	64	11.1	7.9	---	49	66	101	124	140	122	8	--	--	15	82	1
New York	19	39.1	26.8	84.0	67.8	53.9	15	103	-7	992	4989	4.27	2.91	40.38	9.09	.03	3.45	6.6	27.0	22.8	69	60	64	74	55	65	----	----	---	--	--	---	---	---	120	8	--	--	17	76	*
Rochester	543	32.7	16.7	82.7	59.7	47.5	83	102	-22	1249	6863	3 09	2.36	31.74	9.70	.08	4.19	17.9	74.9	29.8	81	73	79	80	50	60	10.9	7.4	73	32	70	83	112	170	167	23	28	17	8	131	5
Schenectady	217	28.8	14.2	82.5	62.8	47.2	--	---	---	1349	7050	3.86	2.22	35.25	-----	----	----	----	----	----	--	--	--	--	--	--	----	---	---	--	--	---	---	---	---	--	--	--	--	---	--
Syracuse	424	33.9	17.0	83.5	61.4	48.8	52	102	-26	1225	6520	3 68	2.52	36.42	15.92	.19	4.79	20.0	81.7	27.2	76	70	76	74	54	65	11.3	8.1	69	30	67	73	114	178	169	24	30	5	7	132	7
NORTH CAROLINA							68	109	-21																																
Asheville CO	2203	48.8	30.0	84.1	63 4	56.3	52	99	-6	794	4072	4.50	2.11	37 22	13.75	02	7.92	2.8	11.0	15.8	82	59	69	88	56	73	9.6	6.2	52	48	59	115	129	121	130	--	52	54	9	83	*
Charlotte	727	52.2	32.3	88.8	68.3	60.5	76	104	-5	704	3205	4 67	2.65	43.09	16.55	T	6.59	1.4	5.8	14.0	80	61	66	82	55	68	7.3	5.9	57	52	65	125	116	124	120	2	46	19	39	46	*
Greensboro	891	49.0	29.0	87.4	66.9	58.1	26	102	-7	806	3810	4.94	2.60	42.49	13.26	.13	7.49	2.3	6.8	14 3	84	60	72	85	57	73	8.3	6.7	63	47	63	114	113	138	120	3	49	33	38	84	*
Hatteras CO	4	54.3	41.6	83.4	73.5	63.1	80	97	8	527	2392	6.48	3.08	54.77	20 95	T	14.73	.3	1.1	12.0	85	76	84	82	75	85	14.3	11.7	110	49	65	142	111	112	124	*	40	9	1	13	0
Raleigh	438	50.8	32.0	89.0	68.0	59.9	68	105	-2	732	3369	5.66	2.82	46.18	13.63	.06	6.66	1.9	7.0	17.8	83	58	71	86	55	72	7.7	6.2	66	49	62	132	117	116	119	4	41	15	40	51	*
Wilmington	30	58.7	36.9	89.1	70.9	63.8	84	104	5	533	2323	8.16	2.59	49.84	21.12	02	9.52	.4	1.5	11.1	84	59	77	86	63	79	9.3	8.7	82	57	65	134	129	102	120	*	46	11	25	27	0
Winston-Salem	967	48.6	30.0	87.0	67 9	58.5	55	104	-10	797	3721	4.57	2.79	43.15	12.92	.15	6.24	2 7	8.6	8.9	75	56	64	80	50	65	----	---	--	--	--	119	110	136	104	2	43	34	41	89	*
NORTH DAKOTA							63	121	-60																																
Bismarck	1650	20.7	-1.4	85.5	58.6	41.7	80	114	-45	1730	9033	3.33	.36	15.40	9.90	T	3.76	6.0	35 4	13.5	73	67	70	80	48	48	10.1	9.8	72	52	73	135	115	115	94	11	31	7	18	185	49
Devils Lake CO	1471	14.2	-4.7	81.7	56.9	38.7	50	112	-46	1866	9940	3.18	.40	17.61	8.55	T	4.82	6.0	34.4	9.5	75	71	75	86	53	52	9.9	8.6	57	52	71	114	111	140	101	11	30	9	11	189	60
Fargo	895	16.9	-2.8	84.2	58.3	40.9	74	114	-48	1795	9274	3.04	.60	18.73	9.58	T	5.17	7.2	38.7	19.2	75	70	75	84	51	57	10.2	8.8	91	47	74	119	116	130	104	11	30	10	11	179	55
Williston CO	1877	19.8	.2	83.5	58.2	41.3	76	110	-50	1705	9068	3.59	.46	14.66	8 84	T	4.16	6.0	33.6	10.6	73	67	70	75	44	41	7.4	7.6	60	50	77	126	126	113	90	12	26	7	17	184	49
OHIO							81	113	-39																																
Akron	1210	34.8	20.0	83.1	61.6	49.7	68	104	-20	1166	6203	4 20	2.13	37.26	11.98	.22	5.96	8.6	35.9	15.6	84	75	79	81	52	64	11.7	7.3	--	--	--	78	112	175	141	11	40	21	15	128	5
Cincinnati Obs.	761	40.9	25.2	87.2	65.9	54.9	39	109	-17	.989	4870	4.07	2 19	39.34	13.68	.17	4.77	4.7	17.8	11.0	--	--	--	--	--	--	8.6	5.5	49	41	72	---	---	---	135	5	53	17	30	96	2
Cincinnati	869	39.7	23.8	85.9	64.3	53.6	--	---	---	1029	5195	4.04	2.17	39.16	-----	----	----	----	----	----	82	69	74	84	51	59	----	----	--	--	--	108	116	141	---	--	--	--	--	---	--
Cleveland CO	663	36.0	23.0	80.9	66.5	51.5	--	---	---	1101	5717	3.35	2.19	33.50	-----	----	----	----	----	----	--	--	--	--	--	--	----	----	--	--	--	---	---	---	---	--	--	--	--	---	--
Cleveland	787	36.0	20.9	84.7	62.6	50.6	84	103	-17	1132	6006	3.13	2.12	32.08	9 77	.17	4.97	10.4	42.4	17.4	80	73	76	74	52	62	14.5	10.3	78	29	71	89	120	156	154	15	35	6	7	114	3
Columbus CO	724	38.2	23.9	85.8	65.8	53.4	--	---	---	1051	5277	3.66	2.00	34.36	-----	----	----	----	----	----	--	--	--	--	--	--	----	----	--	--	--	---	---	---	---	--	--	--	--	---	--
Columbus	815	37.8	21.6	86.2	62.6	52.0	76	106	-20	1094	5615	4.33	2.18	37.88	10.71	.10	3.91	6.6	21 6	11.9	83	72	76	77	51	59	9.8	6.6	84	36	71	104	119	142	140	6	40	5	21	107	3
Dayton	1002	37.3	22.1	85.3	64.7	52.2	40	106	-16	1094	5597	3.90	2.11	35.15	12.41	.10	4.56	6.0	20.0	10.0	81	74	76	78	52	55	11.4	7.6	78	38	73	103	114	148	131	5	48	13	20	105	4
Portsmouth CO	670	42.7	23.4	87.7	61.6	54.1	34	107	-25	989	4965	4.26	2.28	38.56	9.92	.51	3.43	8.8	32.9	10.1	b71	b59	b59	b88	b47	b54	7.7	3.4	60	--	--	39	75	142	106	9	63	64	36	113	0
Sandusky CO	603	35.7	21.8	83.7	65.5	51.3	77	105	-16	1122	5859	3.73	1.92	33.16	12.51	.09	5.98	8.0	28.1	12.3	81	68	78	72	56	65	10.9	7.6	77	34	71	90	122	153	138	12	32	6	13	111	3
Toledo	622	34.6	18.1	84.7	61.5	49.4	84	105	-16	1197	6394	3.55	1.86	31.84	8.49	.04	5.98	8.0	30.5	19.0	79	72	75	76	52	59	12.7	9.2	87	33	70	116	114	135	131	10	35	8	13	120	5
Youngstown	1178	34.9	20.0	83.3	61.2	49.8	11	100	-11	1163	6172	4.16	2.72	41.33	9.87	.43	4.31	9.9	47.0	20.7	84	74	79	80	51	64	12.0	7.3	--	--	--	76	104	185	164	16	36	27	11	133	4
OKLAHOMA							63	120	-27																																
Oklahoma City	1280	47.0	27.2	93 3	70.9	60.4	15	109	-10	865	3644	4.25	1.24	30.22	10 78	T	4.73	3.8	9.1	8 4	79	63	63	83	53	49	16.5	12.1	87	62	79	154	96	115	85	2	50	17	71	73	*
Tulsa	672	46.9	27.9	93.1	71.1	60.6	19	112	-8	856	3584	5.15	1.57	37.68	18.00	T	7.30	3.6	8.0	9.0	80	72	64	84	55	53	11.4	8.9	75	48	71	124	111	130	89	3	55	10	72	73	1
OREGON							65	119	-54																																
Astoria	8	44.0	36.1	66.7	54.8	51 4	1	88	24	772	4995	9.84	.74	62.49	18.94	.65	3.55	----	----	----	--	--	--	--	--	--	----	----	--	--	--	---	---	---	---	--	--	--	--	---	--
Burns CO	4140	35.5	12.2	87.3	52 2	46.8	16	103	-20	1274	6918	1.47	.25	10.25	3.85	.00	1.85	13.5	45.3	10.5	b81	b72	b66	b56	b31	b20	----	----	--	--	--	118	102	145	89	17	13	8	20	182	7
Eugene	361	44.8	31.6	82.4	50.7	52.4	12	105	-3	831	4779	6.00	.26	37.51	12.92	T	3.65	6.3	8.3	7.2	94	87	82	89	54	38	8.9	8.2	--	--	--	77	88	200	143	2	5	56	13	58	*
Meacham	4050	32.0	17.7	77 3	49.0	43.5	10	97	-15	1243	7888	4.41	.42	34.71	9.29	T	3.00	33.3	157.8	22.9	--	79	80	--	40	33	----	----	--	--	--	87	75	203	152	45	21	29	3	170	5
Medford	1312	44.6	29.8	88.8	54.7	54.0	43	115	-10	862	4547	3.13	.17	18 15	9.16	00	3.17	3 6	7.2	11.0	93	88	75	75	44	27	5.3	5.4	--	--	--	124	83	158	99	3	8	42	48	83	*
Pendleton	1492	36.9	24.2	89.0	59.9	52.7	19	110	-18	1066	5204	1 69	.26	12.96	3.03	00	1.49	8.3	17.7	13.3	82	78	77	55	34	23	8.3	9.1	--	--	--	105	96	164	99	6	12	27	29	84	3
Portland CO	30	44.2	34.7	79.2	57.8	54.6	80	107	-2	791	4143	7.10	.42	39.91	20.14	00	7.66	5.7	12.6	16.0	--	--	--	--	--	--	7.5	6.8	57	27	70	89	96	180	152	4	--	--	7	27	*
Portland	22	43.3	31.5	79.2	55.3	53.0	--	---	--	856	4632	6.17	.42	35.23	-----	----	----	----	----	----	87	81	77	85	62	47	----	----	--	--	--	---	---	---	---	--	6	22	--	---	--
Roseburg	505	47.5	34.5	83.4	54.3	54.6	76	109	-6	744	4122	4.93	.20	30.50	12.82	.00	4.15	3.2	6.6	9.1	91	86	78	85	54	38	3.9	5.1	40	25	79	106	118	141	133	1	4	49	15	34	*
Salem	195	44.8	31.9	83.2	52.2	53 1	61	108	-10	825	4574	7.12	.32	39.85	17.54	.00	4.30	3.4	7.1	25.0	88	83	78	87	54	39	----	----	--	--	--	113	78	174	142	3	4	37	14	49	*
Sexton Summit	3836	41.6	30.0	76.4	50.0	48.1	10	100	8	905	6217	4.70	.29	30.96	13.87	.00	5.20	26.8	95.8	18.3	--	88	88	--	60	43	----	----	--	--	--	112	72	181	135	32	6	173	2	114	0
PENNSYLVANIA							67	111	-42																																
Allentown	376	36.5	20.4	85.5	62.7	50 9	11	102	-10	1132	5880	4.78	2.64	42.25	10.09	.34	4.32	8.0	25.7	12.3	--	--	--	--	--	--	9.3	6.0	--	--	--	93	118	154	128	8	33	34	21	127	2
Harrisburg	335	38.6	23.6	85.6	65.1	53.0	66	104	-14	1051	5258	3.70	2.24	36.01	10.67	.02	6.16	8.6	31.2	21.0	74	60	68	75	51	63	7.8	5.8	64	43	67	102	115	148	126	8	33	14	16	97	1
Philadelphia CO	26	41.5	28.2	85.3	69.0	55.7	84	106	-11	933	4523	4 62	2.61	41 44	12.10	.09	5.89	5.7	21.2	21.0	74	65	68	75	56	66	10.9	8.7	88	45	64	109	122	134	123	6	27	10	14	76	*
Philadelphia	13	40.9	25.4	86.5	66.0	54.3	--	---	--	986	4866	4.58	2.60	41.13	-----	----	----	----	----	----	--	--	--	--	--	--	----	----	--	--	--	---	---	---	---	--	--	--	--	---	--
Pittsburgh CO	749	40.2	25.8	85.1	65.6	53.9	--	---	--	992	5048	3.83	2.35	36.23	-----	----	----	----	----	----	--	--	--	--	--	--	----	----	--	--	--	---	---	---	---	--	--	--	--	---	--
Pittsburgh	1151	36.6	21 3	82.8	61.8	50.6	80	103	-20	992	5048	4.07	2.37	36 92	10.25	.06	4.08	8.6	33.3	17.5	77	67	73	77	53	60	11.6	8.5	73	32	65	84	129	152	150	11	40	25	16	102	2
Reading CO	266	39.1	25.3	85.2	66.1	53.7	57	105	-14	1017	5060	4.43	2.68	40.02	13.34	.04	6.08	8.7	29.7	15.5	74	54	69	74	49	64	9.3	7.0	95	43	62	105	120	140	126	7	34	14	20	97	*
Scranton CO	746	35.4	21.0	83.2	61.9	50.1	54	103	-19	1141	6047	4.43	2.02	36.61	11.75	.08	5.09	9.9	41.4	20.0	80	N67	--	77	N50	--	7.4	5.7	56	37	64	83	129	153	137	13	31	7	9	119	2
Williamsport	527	36.0	20.9	85.2	61.4	50.7	59	106	-18	1132	5898	4.31	2.34	39.49	10.32	.16	5.22	9.9	36.7	13.7	78	65	72	85	52	66	8.6	5.1	--	--	--	71	116	178	129	9	22	45	18	129	4
RHODE ISLAND							67	102	-23																																
Block Island	110	38.0	25.7	75.3	62.9	49.9	74	95	-10	1026	5843	3.67	2.55	38.63	12.93	T	6.22	4.9	19.9	12.0	79	74	77	88	77	90	19.8	12.7	91	45	62	125	115	125	122	7	17	53	*	84	*
Providence	55	36.8	20.6	80.0	61.9	49.4	50	102	-17	1125	6125	3.75	2.83	39 63	12.24	.04	6.17	9.7	32.9	15.0	73	60	67	80	57	73	11.8	9.1	95	49	63	126	113	126	121	10	21	14	9	107	2

See reference notes at end of table.

Table 10a - Continued

NORMALS, MEANS AND EXTREMES

State and Station	Elevation ground (feet)	Temperature (°F)								Normal degree days (1921-1950)		Precipitation (inches)									Relative humidity (percent)						Wind Speed (m.p.h.)			Sunshine (percent of possible)		Annual mean number of days									
		Normal (1921-1950)					Period Extremes					Normal (1921-1950)			Extremes			Snow, sleet, hail			January			July			Mean hourly					Sunrise to sunset							Temperature		
		January		July														Mean total		Extreme																			Max.	Min.	
		Daily maximum	Daily minimum	Daily maximum	Daily minimum	Annual	Length, yrs.	Record highest	Record lowest	January	Seasonal	Wettest month	Driest month	Annual	Wettest month	Driest month	Maximum in 24 hours	January	Seasonal	Maximum in 24 hours	7:30 a.m. EST	1:30 p.m. EST	7:30 p.m. EST	7:30 a.m. EST	1:30 p.m. EST	7:30 p.m. EST	January	July	Fastest mile	January	July	Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet, hail 1.0 inch or more	Thunderstorms	Heavy fog	90° and above	32° and below	Zero and below
SOUTH CAROLINA							70	111	-13																																
Charleston CO	9	59.0	43.8	88.0	75.0	66.6	84	104	7	445	1769	8.04	1.92	45.99	19.18	0.01	10.57	T	0.2	3.9	--	--	--	--	--	--	9.9	9.4	76	58	66	130	133	102	111	*	58	16	28	9	0
Charleston	41	61.4	39.2	89.4	70.8	65.2	--	---	--	472	1973	8.04	2.05	48.14	-----	----	-----	----	----	---	87	56	76	88	64	81	----	----	--	--	--	---	---	---	---	--	--	--	---	--	--
Columbia	217	58.1	35.9	91.9	70.8	64.0	67	107	-2	566	2435	6.56	2.25	46.15	15.40	.04	7.40	0.4	2.0	11.7	81	58	65	83	56	68	8.2	7.0	54	53	62	139	115	111	113	*	47	12	59	31	*
Florence	146	56.3	36 3	91.1	70 6	63.6	73	108	-1	588	2507	6.45	2.27	45.33	21.33	.00	9.15	.5	1.3	10.0	86	55	70	85	55	72	----	----	--	--	--	171	86	108	106	0	53	28	54	39	0
Greenville	1018	51.6	35.0	87.9	68.8	61.0	37	104	4	673	3060	4.81	3.00	47.65	13.36	.07	7.32	1.5	3.5	14.4	79	60	70	81	54	67	8.3	6.7	79	52	66	131	109	125	122	*	52	16	41	42	0
Spartanburg	801	52.1	34.7	88.7	69.1	61.2	24	104	5	670	3044	4.70	2.97	46.66	12.00	.04	6.85	.9	2.8	11.2	--	--	--	--	--	--	----	----	--	--	--	114	121	131	112	*	48	20	55	50	0
SOUTH DAKOTA							65	120	-58																																
Huron	1282	24.8	2.1	89.5	61.3	45.7	73	111	-43	1597	7902	3.06	.45	17.54	11.56	T	4.07	6.2	29.9	15.1	76	71	72	81	52	49	10.8	9.9	73	55	76	134	127	104	93	13	38	8	25	169	35
Rapid City	3165	33.1	9.1	85.8	58.8	46.1	55	109	-33	1361	7535	3.36	.32	17.10	9.66	T	5.57	4.7	33.5	18.3	69	57	65	73	44	42	12.6	11.4	75	58	73	135	121	109	94	11	42	17	24	158	21
Sioux Falls	1420	24.4	4.0	87.9	61.6	45.8	62	110	-42	1575	7848	4.25	.67	25.24	9.42	.00	4.13	6.3	32.0	16.6	76	66	73	84	53	53	11.5	9.3	--	--	--	102	105	158	96	11	48	20	24	168	31
TENNESSEE							72	113	-32																																
Bristol	1519	48.5	28.6	85.5	64.0	56.4	17	102	-10	818	4148	5.14	2.39	41.24	9.73	.32	3.21	2.4	10.6	16.2	85	65	73	87	55	68	6.9	4.1	--	--	--	90	119	156	132	3	48	42	25	94	*
Chattanooga	670	51.6	31.6	89.6	67.0	60.0	76	106	-10	725	3384	6.05	2.69	53.60	15.29	.04	7.61	2.1	5.9	12.0	79	62	68	83	56	67	7.6	5.5	82	43	61	115	132	118	132	3	58	26	38	51	*
Knoxville	950	49.8	31.1	89.1	67.6	59.3	84	104	-16	760	3590	4.83	2.53	45.51	17 32	.07	6.20	2.5	9 0	18.2	83	65	69	83	55	66	7.3	5.9	71	42	64	119	122	124	133	3	47	18	32	64	*
Memphis CO	271	49.3	34.5	89.4	73.2	62.4	--	---	--	716	3006	5.38	2.50	46.81	-----	----	-----	----	----	----	--	--	--	--	--	--	----	----	--	--	--	---	---	---	---	--	--	--	---	--	--
Memphis	263	50.3	32.9	91 1	71.3	61.8	80	106	-11	725	3137	5.58	2.55	49.42	18.16	.00	10.48	1.9	5.2	18.0	79	68	70	81	57	63	12.8	7.8	57	44	73	140	107	118	112	2	51	6	53	45	*
Nashville	577	48.9	30.9	90.6	69.3	60.1	84	107	-13	778	3513	5.28	2.52	45.03	14.75	.03	6.05	2.6	8.4	17.0	84	66	73	81	53	61	9.6	7.0	73	42	68	120	121	124	120	3	52	11	42	60	*
Oak Ridge CO	905	48.3	27.9	90.1	65.5	57.9	7	105	0	834	4028	6.06	2.42	53.72	13.27	.54	4.73	1.9	5.2	6 5	--	--	--	--	--	--	4.8	3.7	30	--	--	127	105	133	127	3	56	32	46	83	*
Oak Ridge Area	886	48.6	28.3	90.0	65 1	57.8	10	103	1	822	4006	5.64	2.77	52 38	12.84	.50	7.75	----	----	----	--	--	--	--	--	--	6.0	3.9	--	--	--	---	---	---	116	--	--	--	41	76	0
TEXAS							77	120	-23																																
Abilene	1759	55.1	31.4	94.6	71.5	64.1	69	111	-9	673	2657	3.68	.88	22.55	15.70	.00	6.78	1.4	3.8	8.0	73	50	55	74	39	40	10.4	9.8	109	58	79	159	109	97	65	*	40	1	94	42	*
Amarillo	3590	48.9	21.6	91 8	63.8	56.6	63	108	-16	921	4345	3.25	.62	21.12	9.81	.00	6.75	3.6	19.0	20.6	73	51	54	76	41	42	11.8	11.1	84	71	81	191	108	66	71	5	40	10	57	100	1
Austin	615	59.8	40.0	94.4	73.7	68.2	57	109	-2	484	1713	4.37	1.67	35.18	20.78	.00	19.03	.4	.9	9.7	83	63	64	88	50	51	8.7	7.8	57	46	77	144	112	109	78	*	41	20	104	19	*
Brownsville	16	68.9	52.0	91.8	75.7	73.6	73	104	12	219	617	6.27	1.14	29.55	30.57	.00	11.91	T	T	T	88	66	76	91	57	68	10.9	10.1	106	44	78	110	144	111	76	0	28	16	106	3	0
Corpus Christi	40	65.3	46.5	91.2	74.1	70.8	68	105	11	330	1011	4.70	1.39	28.00	15.89	.00	8.26	T	T	5.0	86	70	78	89	63	73	11 1	12.2	110	47	86	126	124	115	80	*	33	16	36	4	0
Dallas	487	55.3	36.0	95.4	75.6	66.5	41	111	-3	607	2272	4.97	1 83	34.42	13 04	T	9.18	1.2	2.4	7.1	80	62	62	78	49	47	10.4	9.1	77	51	79	157	101	107	81	4	49	6	92	30	*
Del Rio	1091	62.2	41.6	93.3	76.1	69.8	49	111	11	419	1407	2.51	.80	18.58	13.71	00	8.88	.4	.7	4.7	81	59	53	80	50	41	7.8	9.6	62	53	75	155	117	93	62	*	26	6	118	14	0
El Paso	3920	55.8	30.9	93.5	69.0	63.3	68	107	-6	670	2641	1.32	.27	7.83	8.18	.00	6.50	1.0	2.6	8.4	61	40	35	60	34	30	8.7	8.6	70	74	78	214	111	40	49	1	28	2	90	44	*
Fort Worth	544	54.9	35.6	95.2	74.9	66.0	56	112	-8	619	2338	4.92	1.88	33.69	17.64	.00	9.57	1.1	2.5	8.2	78	61	61	78	48	45	10.9	9.7	68	56	78	161	111	93	77	1	47	7	93	32	*
Galveston CO	7	59.8	49.2	87.4	78.6	70.1	84	101	8	356	1211	5.44	2.88	45.19	26.01	.00	14.35	T	.2	15.4	87	77	83	82	69	74	11.4	9.6	91	50	71	143	125	97	98	*	49	19	13	4	0
Galveston	5	60.4	48.2	88.7	77.9	70.1	--	---	--	362	1233	5.82	3.14	47.98	-----	----	-----	---	---	----	--	--	--	--	--	--	----	---	--	--	--	---	---	---	---	--	--	--	---	---	--
Houston CO	41	61.9	45.7	92.3	75.2	70.0	65	108	5	378	1276	4.84	2.81	45.37	17.64	T	10.83	.1	.2	3.0	86	66	73	90	58	66	10.6	8.4	84	49	69	117	126	122	101	*	56	16	84	8	0
Houston	50	62.6	44.0	92.2	72.9	68.9	--	---	--	394	1388	4.79	2.70	46.93	-----	----	-----	---	---	----	--	--	--	--	--	--	----	---	--	--	--	---	---	---	---	--	--	--	---	---	--
Laredo	500	68.8	46.4	99.7	75.7	74.3	18	115	18	270	781	3.18	.85	19.49	8.62	.00	5.55	.1	.2	2.0	82	58	53	84	47	42	10.9	15.5	--	--	--	129	126	110	55	*	31	12	176	6	0
Lubbock	3243	51.8	25.7	92.0	66.6	59.5	8	106	-9	812	3587	3.36	.53	18.89	7.80	.00	5.14	1.6	4.1	5.6	72	48	49	78	45	39	12.6	12.2	70	--	--	172	105	88	56	3	44	7	87	102	*
Port Arthur	16	61.7	44.0	90.7	72.6	68.1	10	102	13	406	1517	6.80	2 93	55.21	20.01	.00	9.41	.4	.4	1.8	91	71	82	94	63	73	11.1	7.6	--	--	--	107	133	125	103	*	74	46	81	12	0
San Angelo	1903	57.2	37.3	94.4	71.0	66.2	7	107	1	556	2107	2.96	.95	19.83	5.00	.00	4.65	1.5	1.9	5.1	69	46	42	72	41	36	10.6	9.5	--	--	--	168	94	103	50	1	38	4	113	39	0
San Antonio	792	60.9	40.3	95.1	73.2	68.8	70	107	0	462	1579	3.52	1.40	27.93	15.78	.00	7.08	.2	.4	5.0	79	61	59	86	51	49	8.4	7.9	74	48	74	130	131	104	83	0	35	17	106	13	*
Victoria	110	64.1	46.2	92.8	76.8	71.2	51	110	9	352	1126	4.13	1.97	35.66	16.48	.00	8.40	.2	.2	3.0	86	63	70	93	53	61	11.7	8.8	62	--	--	108	124	133	66	*	49	29	122	11	0
Waco	500	57.1	37.5	95.4	74.6	67.3	67	111	-5	557	2025	4.15	1.38	32.95	13.01	.00	7.18	.7	1.8	7.0	82	63	63	84	51	48	12.0	10.7	65	--	--	144	102	119	61	*	37	9	111	26	*
Wichita Falls	1027	51.7	29.4	94.8	72.7	63.1	11	110	-12	756	3025	3.86	1.31	26.64	11.86	.00	3.93	2.0	4.6	5.0	77	56	59	77	48	44	12.5	10.7	--	--	--	166	96	103	68	22	46	11	102	58	*
UTAH							64	116	-50																																
Milford	5028	36.0	11.5	92.5	55.5	49.0	37	104	-34	1277	6445	1.06	.40	8.44	3.75	.00	1.92	7.8	34.1	16.3	82	68	68	61	28	26	11.5	9.0	--	--	--	160	105	100	57	16	31	8	54	181	17
Salt Lake City	4220	35.9	17.0	92.3	60.8	51.3	26	106	-30	1194	5866	1.76	.61	14.74	4 90	.00	2.03	13.7	50.1	15.4	80	70	72	56	28	24	7.6	9.5	71	48	81	135	108	122	86	16	36	10	50	133	5
VERMONT							67	105	-50																																
Burlington	331	27.6	8.2	82.4	58.4	44.5	71	101	-29	1460	7865	3.75	1.53	32.22	10.13	T	4.49	15.1	65.4	24.2	81	70	79	76	54	67	11.8	8.2	72	34	62	72	109	184	146	19	27	11	4	148	19
VIRGINIA							63	110	-29																																
Lynchburg	947	46.6	28.7	86.1	65.9	56.6	83	106	-7	846	4153	4.35	2.37	39.57	14.87	.03	7.59	4.2	13.9	16.4	74	58	67	80	56	69	8.3	6.6	62	48	68	128	132	105	124	4	36	21	32	78	*
Norfolk	26	50.0	33 0	86.0	68.9	59.2	84	105	2	729	3454	6.05	2.45	43.26	15.61	.04	6.84	2.4	8 6	17.7	79	61	71	81	60	76	11.9	9.6	80	50	66	129	115	121	123	3	39	16	26	40	0
Richmond	162	48.1	28.4	87.8	67.2	57.7	57	107	g-3	828	3955	5.64	2.49	42.89	16.08	.11	7.26	3.5	12.4	17.2	84	60	69	81	56	72	8.2	6 5	68	49	65	132	111	122	122	4	40	16	33	71	*
Roanoke	1174	46.6	29.2	86.8	65.0	56.6	52	105	-12	840	4152	4.91	2.56	41.58	16.71	.16	6.00	4.5	15.3	8.2	76	57	66	81	52	65	----	---	--	--	--	105	122	138	125	5	43	29	36	83	0
WASHINGTON							88	118	-42																																
Olympia	190	43.3	30.6	76.3	49.2	50.0	13	103	-1	868	5501	8.66	.66	45.74	19.84	.00	4.93	9.3	15.2	13 7	92	87	82	92	61	46	6.9	4 9	--	--	--	55	96	214	159	5	3	91	5	86	*
Seattle CO	14	45.2	36.2	75.1	56.1	53.2	64	100	3	753	4438	5.34	.52	31.92	15.33	.00	3.52	4.9	11.1	21.5	--	--	--	--	--	--	10.3	7.9	65	25	64	75	106	184	151	3	6	24	1	20	0
Seattle	14	45.0	33.0	76.2	54.1	52.1	--	---	--	----	----	5.72	.58	34.28	-----	----	----	---	----	----	86	80	74	86	63	47	----	---	--	--	--	---	---	---	---	--	--	--	---	---	--
Seattle-Tacoma	379	43.0	31.4	75.0	52.8	50.7	--	---	--	862	5275	5.68	.58	33.80	-----	----	----	---	----	----	--	--	--	--	--	--	----	---	--	--	--	---	---	---	---	--	--	--	---	---	--
Spokane	2357	30.2	19.6	82.4	56.8	47.1	73	108	-30	1243	6852	2.21	.36	14.92	5.85	.00	2.22	12.7	38 3	13.0	85	79	76	63	38	24	6.3	6.8	56	27	82	96	104	165	112	13	11	19	19	114	4
Stampede Pass	3958	27.5	19.8	67.2	46.5	39.9	11	88	-11	1280	9149	14.66	1.29	93.60	29.06	.42	5.74	96.0	471.9	36.2	93	92	92	82	63	57	12.8	12.3	94	--	--	69	63	233	202	82	8	257	0	191	3
Tatoosh	101	44.9	39.0	59.2	51.7	49 3	65	88	7	713	5724	12.04	1.99	75.75	25.84	.01	5.91	3.8	8.0	13.8	85	83	83	94	89	87	20.1	9.7	94	26	48	61	83	221	198	2	4	50	0	7	0
Walla Walla CO	949	37.7	26.3	89.3	63.0	54.2	82	113	-29	1023	4848	1.86	.28	15.07	5.15	.00	2.74	8.4	21.4	14.0	82	N73	80	54	N29	24	5.5	5.6	70	25	84	130	107	128	108	9	9	13	34	66	1
Yakima	1061	35.9	17.8	89.9	52.9	50.2	45	111	-25	1181	5845	1.10	.18	7.21	3.75	.00	1.25	8.4	21.4	11.0	84	75	73	71	34	26	6.7	8.2	35	34	86	136	99	130	64	10	6	15	37	129	3
WEST VIRGINIA							63	112	-37																																
Charleston	950	46.3	26.5	87.3	63.5	55.8	46	108	-17	887	4417	5.45	2.81	45.00	11.32	.00	3.70	4.8	16.8	15.1	78	64	70	87	51	64	9.0	5.9	55	--	--	61	118	186	150	6	49	112	31	96	*
Elkins	1970	42.8	21.5	82.5	57.4	50.4	56	99	-28	1017	5773	5.26	2.86	44.04	11.10	.26	5.45	10.8	47.9	18.8	82	65	77	94	61	76	6.2	3.7	72	33	56	72	117	176	171	19	47	69	4	131	5

See reference notes at end of table.

NORMALS, MEANS AND EXTREMES

Table 10a - Continued

State and Station	Elevation ground (feet)	Temperature (°F) Normal (1921-1950) January Daily maximum	Temperature Normal January Daily minimum	Temperature Normal July Daily maximum	Temperature Normal July Daily minimum	Temperature Normal Annual	Temperature Period Extremes Length, yrs.	Record highest	Record lowest	Normal degree days (1921-1950) January	Normal degree days Seasonal	Precipitation (inches) Normal (1921-1950) Wettest month	Normal Driest month	Normal Annual	Extremes Wettest month	Extremes Driest month	Extremes Maximum in 24 hours	Snow, sleet, hail Mean total January	Snow Mean total Seasonal	Snow Extreme Maximum in 24 hours	Relative humidity (percent) January 7:30 a. m. EST	January 1:30 p. m. EST	January 7:30 p. m. EST	July 7:30 a. m. EST	July 1:30 p. m. EST	July 7:30 p. m. EST	Wind Speed (m.p.h.) Mean hourly January	Mean hourly July	Fastest mile	Sunshine (percent of possible) January	Sunshine July	Annual mean number of days Sunrise to sunset Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet, hail 1.0 inch or more	Thunderstorms	Heavy fog	Temperature Max. 90° and above	Temperature Min. 32° and below	Temperature Min. Zero and below
WEST VIRGINIA (Cont'd.)																																									
Huntington CO	565	48.0	28.0	88.6	65.2	57.4	14	105	-10	837	4073	4.82	2.43	41.79	8.93	0.22	4.23	5.3	16.6	10.3	--	--	--	--	--	--	----	----	--	--	--	---	---	---	136	--	--	--	51	102	1
Parkersburg CO	615	42.7	26.1	86.2	65.1	54.9	66	106	-27	949	4750	4.18	2.12	39.11	11.46	.07	4.81	6.7	24.5	18.3	82	N66	74	80	N52	67	7.3	5.2	66	29	63	110	103	152	143	6	42	11	23	97	2
WISCONSIN							64	114	-54																																
Green Bay	689	24.5	7.7	81.1	58.7	43.6	68	104	-36	1516	8259	3.57	1.26	26.51	9.70	T	4.41	10.7	44.2	20.0	75	67	73	78	55	58	10.4	8.7	109	44	70	83	117	165	120	13	32	27	7	152	21
La Crosse	652	25.0	6.3	85.1	62.8	46.2	82	108	-43	1528	7650	3.87	1.11	28.92	12.09	.01	7.23	10.7	43.0	13.1	83	70	76	85	58	59	9.0	7.5	69	48	73	108	119	138	117	13	36	19	12	157	29
Madison CO	938	26.7	11.8	82.2	64.0	46.9	86	107	-29	1417	7300	4.11	1.27	30.71	10.69	T	5.31	9.7	38.2	12.9	79	71	76	79	52	56	---	---	77	43	70	100	120	145	115	11	43	17	8	143	18
Madison	857	27.9	10.3	85.7	60.2	46.6	--	---	---	1423	7417	4.02	1.13	30.00	-----	----	----	----	----	----	--	--	--	--	--	--	11.7	8.8	--	--	--	---	---	---	---	--	--	--	---	---	--
Milwaukee	675	29.2	14.5	81.2	61.4	46.8	84	105	-25	1336	7205	3.33	1.27	27.57	10.03	.05	5.76	12.5	46.0	20.3	76	68	74	75	59	65	12.2	9.0	73	43	72	108	119	138	124	13	33	19	8	128	13
WYOMING							95	114	-63																																
Casper	5322	31.8	12.8	86.3	55.8	45.1	15	104	-40	1324	7638	2.32	.65	14.09	5.75	T	3.09	9.8	68.1	20.6	67	56	60	66	32	27	18.2	10.4	--	--	--	101	120	144	91	19	38	5	26	171	15
Cheyenne	6131	37.1	13.8	82.6	53.6	44.9	82	100	-38	1225	7562	2.46	.52	16.25	7.66	.00	4.70	5.2	56.2	15.6	57	48	53	70	36	42	13.9	9.0	75	65	70	123	147	95	96	17	46	15	7	174	12
Lander	5563	28.0	5.6	84.4	56.3	43.2	63	102	-40	1494	8303	2.57	.49	14.18	7.19	.00	3.66	5.5	72.5	21.5	75	61	63	64	33	30	4.4	5.3	72	65	76	136	154	75	69	17	22	1	13	192	27
Sheridan	3942	32.8	7.4	86.1	55.0	44.5	47	106	-41	1392	7903	2.64	.61	16.75	9.54	T	4.41	9.6	56.8	15.3	72	61	66	73	36	35	5.9	5.7	84	56	76	121	125	119	105	24	35	3	25	186	28
PACIFIC AREA (f)																					b	b	b	b	b	b															
Canton Island	9	88.0	78.0	90.0	78.4	83.7	8	98	70	----	----	3.78	.27	20.01	11.50	T	4.15	.0	0	.0	80	79	65	80	79	64	---	----	--	--	--	76	202	87	98	0	5	0	201	0	0
Koror CO	94	85.0	75.4	85.2	75.8	80.9	5	93	69	----	----	18.81	7.68	147.98	27.46	1.65	8.47	.0	.0	.0	88	90	82	87	86	81	4.3	3.0	--	--	--	23	125	217	260	0	23	0	46	0	0
Ponape CO	112	86.4	76.0	88.0	72.7	81.0	4	96	68	----	----	19.66	7.87	182.44	31.86	3.32	6.06	.0	.0	.0	85	--	77	96	--	81	---	----	--	--	--	4	100	261	297	0	23	0	59	0	0
Truk (Moen Island)	8	85.3	76.5	86.6	74.0	80.8	4	94	70	----	----	13.46	6.63	131.91	24.14	.84	10.44	.0	.0	.0	82	82	79	86	90	80	---	----	--	--	--	23	119	223	236	0	9	0	3	0	0
Wake Island	11	81.1	73.8	86.3	77.6	79.9	7	91	64	----	----	8.90	1.26	41.30	19.54	.34	15.00	.0	.0	.0	75	76	69	82	82	73	12.6	11.7	--	--	--	132	155	78	189	0	7	0	2	0	0
Yap CO	53	85.4	76.1	87.6	75.7	81.6	6	97	70	----	----	16.60	4.71	122.14	29.44	1.08	8.87	.0	.0	.0	85	87	77	89	90	78	10.0	4.2	--	--	--	15	91	259	256	0	9	0	72	0	0
HAWAII (f)							50	100	18												b	b	b	b	b	b															
Hilo	31	78.4	62.4	82.6	67.0	73.0	8	93	55	----	----	15.99	6.75	139.98	50.82	.36	13.41	.0	.0	.0	85	81	70	88	83	69	5.7	5.2	45	50	45	23	119	223	285	0	6	0	*	0	0
Honolulu CO	12	76.7	67.2	82.2	73.5	75.2	50	88	56	0	0	4.31	.63	23.92	18.36	.06	13.52	.0	T	T	--	--	--	--	--	--	9.1	10.0	62	62	67	108	178	79	152	0	6	0	0	0	0
Honolulu	7	73.6	65.8	84.6	73.0	75.9	--	--	--	----	----	4.65	.23	21.70	-----	----	-----	---	---	---	81	80	62	74	69	56	---	----	--	--	--	---	---	---	---	--	--	--	---	---	--
Lihue	115	77.4	62.7	82.4	72.4	74.0	4	87	52	----	----	6.23	1.65	42.49	14.54	.66	8.36	.0	T	T	84	85	69	81	77	66	10.1	12.6	43	52	54	56	174	135	204	0	9	0	0	0	0
CARIBBEAN																					b	b	b	b	b	b															
Swan Island	26	82.5	73.3	87.4	77.4	80.7	12	92	64	0	0	9.25	1.00	53.82	27.61	.02	10.77	---	---	---	80	72	80	85	75	81	10.5	9.4	40	--	--	95	159	111	157	0	45	0	19	0	0
PUERTO RICO							55	103	40																				E												
San Juan CO	47	79.6	70.2	84.2	75.7	78.0	56	94	62	0	0	6.51	2.42	60.00	16.88	.05	10.55	0	0	0	81	72	78	78	77	82	12.4	13.2	149	64	64	94	196	76	211	0	50	0	9	0	0
San Juan	9	80.1	69.5	84.2	75.7	78.0	--	---	--	----	----	7.49	2.78	67.80	-----	----	-----	---	---	---	--	--	--	--	--	--	---	----	--	--	--	--	---	---	---	--	--	--	---	---	--
ALASKA (Northern)							69	100	-76																																
Anchorage	92	20.4	5.5	65.4	49.1	35.3	32	86	-38	1612	10789	2.71	.40	14.27	5.91	.00	1.79	10.9	55.6	14.0	75	75	73	86	75	63	5.2	5.4	66	41	45	72	90	203	102	20	*	24	#13	201	34
Barrow	22	-8.5	-21.6	46.0	33.3	10.1	34	78	-56	2483	19994	.83	.10	4.11	2.44	.00	1.00	2.1	26.6	15.0	66	66	64	96	92	89	10.8	11.8	70	--	--	b64	h54	h179	65	3	*	59	#*	322	169
Bethel	10	14.6	-1.1	62.4	46.6	29.6	31	90	-52	1804	12880	4.02	.55	18.17	12.37	T	2.40	8.5	49.9	18.7	79	79	78	94	87	70	10.9	9.1	--	--	--	54	69	242	154	27	2	26	#13	230	73
Fairbanks	436	-.3	-19.2	70.5	51.2	26.2	25	91	-66	2319	14158	2.26	.29	11.92	6.88	T	2.33	13.6	58.5	15.5	67	68	67	88	72	52	3.3	5.9	60	34	45	74	91	200	110	18	9	20	#48	231	120
Kotzebue	10	.6	-13.7	58.5	46.7	20.6	12	82	-48	2220	16151	1.95	.27	8.02	5.18	T	1.80	3.5	35.5	8.6	69	70	69	90	87	79	15.3	13.1	--	--	--	80	72	213	115	11	*	20	#4	252	117
McGrath	334	1.1	-18.5	68.0	49.3	25.5	14	89	-64	2285	14390	3.63	.49	19.13	6.26	.01	2.39	15.6	89.0	15.2	70	68	71	88	76	58	2.8	5.4	--	--	--	64	69	232	142	24	5	9	#28	230	111
Nome	13	12.9	-1.7	55.4	43.8	26.3	38	84	-47	1841	14086	3.76	.59	18.69	8.43	.00	2.30	10.2	63.2	14.0	77	80	76	91	87	83	10.5	9.4	75	44	32	95	79	191	131	21	1	20	#3	241	78
Northway	1713	-8.5	25.7	69.8	48.5	22.4	12	88	-72	2545	15506	2.89	.22	11.34	6.42	T	3.91	7.7	36.2	11.5	67	67	65	87	67	51	3.1	5.9	--	--	--	44	84	237	100	11	12	16	#39	244	135
ALASKA (Southern)							72	99	-51																																
Annette	110	38.6	30.5	62.5	51.0	45.6	14	90	-4	942	7096	14.38	4.49	96.59	21.35	.62	5.04	12.9	42.8	14.2	78	76	72	92	81	74	14.0	8.7	--	--	--	37	67	261	219	13	1	18	#16	75	*
Cordova	40	32.4	17.6	60.1	46.4	38.6	11	84	-33	1240	9615	15.56	4.19	98.64	27.72	.08	7.92	27.7	113.7	17.2	82	81	81	91	89	81	4.3	3.1	--	--	--	57	50	258	218	36	1	10	#8	191	23
Juneau	15	31.2	21.1	62.4	47.0	40.6	11	83	-21	1203	8888	8.47	2.98	55.94	13.29	.27	4.66	17.1	81.2	31.0	79	79	77	88	78	68	8.8	7.1	68	29	27	41	42	282	224	23	*	22	#22	144	11
St. Paul Island	22	29.9	22.9	49.3	42.4	35.2	37	64	-26	1197	10839	3.49	1.02	24.24	9.32	.08	1.93	13.4	55.5	13.0	86	85	85	94	96	93	19.5	11.0	114	--	--	25	70	270	203	19	*	37	#0	188	4
Yakutat	28	33.0	19.9	58.6	46.8	39.3	8	79	-22	1194	9354	19.93	4.96	134.15	36.45	.52	5.32	41.1	192.1	20.5	79	79	77	97	85	80	9.2	7.3	--	--	--	41	45	279	223	46	1	32	#5	171	15

Data from airport or combined city office records unless otherwise indicated.
CO after station name indicates City Office data
Data for this table are based on records through 1954. Normal values are based on the period 1921-1950, and are means adjusted to represent observations taken at the present standard location.
Fastest mile data only includes period when station was equipped with a triple or single register automatic recording wind instrument.
* Less than one-half.
# Number of days Maximum 70°F or above for Alaskan Stations.
a Airport data.

- Data not available.
E Estimated.
N Computed as of noon local time.
T Trace, an amount too small to measure.
Z Prior to 1920 when observations were made at Cooperative Station a minimum of 24°F.
b Relative humidity recorded 30 minutes earlier.
g City Office data through 1952, Airport thereafter. Record lowest at Airport -12; Jan. 1940.
h Sun below horizon November 18 - January 24.

GENERAL SUMMARY OF TORNADOES, 1954

Compiled by L. V. Wolford

U. S. Weather Bureau, Washington, D. C.

A greater number of tornadoes were reported to have occurred in the United States and its possessions during 1954 than in any of the previous 39 years of tabulation of these storms by the Weather Bureau. However, the resulting yearly loss of 35 lives and property damage amounting to $28,367,400 were comparatively not great. It is possible that with the increased interest that has developed lately in tornadoes, more observations are being made than formerly and a greater number are being reported. Six hundred and ninety tornadoes were recorded on 177 days during the year, exceeding the previous largest annual number of tornadoes that occurred in 1953 by 158. Included in this 1954 total were 104 funnel clouds which failed to reach the ground, 36 waterspouts, one of which reached land and caused $10,000 damage, and 3 dust devils which caused slightly over $1,500 damage. Twelve of the year's tornadoes crossed States' boundaries. The loss of 35 lives was exceedingly low, compared with 516 last year and the annual average of 225. Only in 1937 and 1951 has the reported death toll been lower. The number of persons receiving injuries, 685, was also considerably less than last year's 5,157. The smaller number of fatalities and injuries is no doubt partly due to the improved storm-warning network, but principally to the fact that more large cities were hit in 1953 than in 1954. The 1954 property damage of $28,367,400 was the lowest since 1950.

Forty-five states and Alaska were visited by tornadic disturbances during 1954. No tornadoes were reported in Nevada, New Jersey, Rhode Island, the District of Columbia, Hawaii, or the West Indies. Texas had the greatest number, 106, of which 27 were funnel clouds aloft and 1 was a waterspout. Kansas followed with 96 occurrences, 23 of which were funnels which failed to reach the ground. Oklahoma was third, reporting 69 tornadoes, 14 being funnel clouds aloft.

June with a total of 144 tornadoes again exceeded May which is usually the month of maximum occurrence of these storms. April was next with 136, and May third with 122. Tornado activity was greatest on April 30, with the reported occurrence of 32 such storms. January and November reported the monthly minimum number of 4 each.

Of the 35 fatalities resulting from tornadoes, 10 occurred in March, 5 of them during the tornado on the 13th in Georgia. May had the next highest death total of 8, of which 6 resulted from the tornado of May 30 in Nebraska the season's highest number of deaths in a single tornado. No loss of life was reported during January, July, or November. The greatest number of deaths during the year occurred in Georgia with a total of 9, followed by Nebraska with 7.

During March over $11,000,000 property damage occurred, which is nearly one-half of the year's estimated damage, and resulted principally from the disastrous tornadoes in Georgia on the 13th. May was next with losses amounting to a little over $4,100,000, followed by June with slightly over $4,000,000. The least amount of destruction resulted from the January tornadoes. The destruction of property in Georgia greatly exceeded that in any other state during 1954, with damage estimated at $2,594,600. Losses also exceeded $1,000,000 in Iowa, Mississippi, and Indiana. These damage reports indicate losses of over $21,000,000 in 6 states and of about $7,000,000 in the remaining 36 states where losses were reported. In Arizona and Oregon tornadoes were reported, but they either remained aloft or struck in open country, with no property damage. Tornadic disturbances in the form of waterspouts were also experienced in Vermont and Alaska, but no damage resulted.

Only 3 tornadoes caused property losses of over $1,000,000 during the year. The most destructive of these occurred on March 13, beginning at Fort Mitchell, Ala., and crossing to Fort Benning, Ga.; losses of $6,015,300 to property, 2 deaths, and 20 injuries resulted. The tornado in Taylor, Crawford, and Bibb Counties, Ga., which struck also on March 13, was apparently the second most destructive as to value of property destroyed, with an estimated loss of $3,175,000, 5 fatalities, and 75 personal injuries. Another outstanding storm passed through Cottle County, Texas, on June 1, causing losses of $2,611,500 and resulting in 1 death and 14 injuries. Damage of about $1,240,000 occurred in Iowa and Missouri on April 30, but apparently this damage was the result of 5 separate tornadoes. The tornado in Nebraska on May 30 caused 6 deaths, more than resulted from any of the above storms, but the estimated property damage was only about $450,000.

About 82 percent of the 671 tornadoes on which the time of occurrence was given struck between noon and midnight, with the greatest activity between 3 and 4 p.m. Only 18 percent were reported between midnight and noon, the hour of least occurrences being between 4 and 5 a.m. About 70 percent of the midnight to noon tornadoes were reported in the southern portion of the Country.

The year was nearly normal in respect to the direction of movement of tornadoes, with slightly over 57 percent traveling from the southwest to the northeast, being only a little below the 39-year average movement in that direction. About 19 percent came from the west and approximately 8 percent from the northwest. These figures show that about 84 percent moved from a general westerly direction, compared to the 39-year average of approximately 87 percent. See the tornado rose for 1954 presented in Figure 1.

Tornado paths were generally rather short during the year, averaging about 10.9 miles. Of the 337 tornadoes for which the lengths of paths were given, 49 were merely designated as short, and 44 more had paths of 1/2 mile or less, making over one-fourth of the tornadoes with paths of probably 1/2 mile or less in length. Only 63 tornadoes had paths of more than 10 miles in length, with 3 paths exceeding 100 miles. The longest path appears to have been of the tornado which moved from Sturgeon, Mo., to near Kahoka, Iowa, on April 30, the total length being about 180 miles. Also on April 30 another tornado traveled for 140 miles across Milam, Leon, Williamson, Robertson, and Houston Counties, Texas. The third long path began near Opelika, Lee County, Ala., and moved to the vicinity of Manchester, Meriwether County, Ga., on December 5, covering 100 miles. The average width of tornado paths during 1954 was about 246 yards.

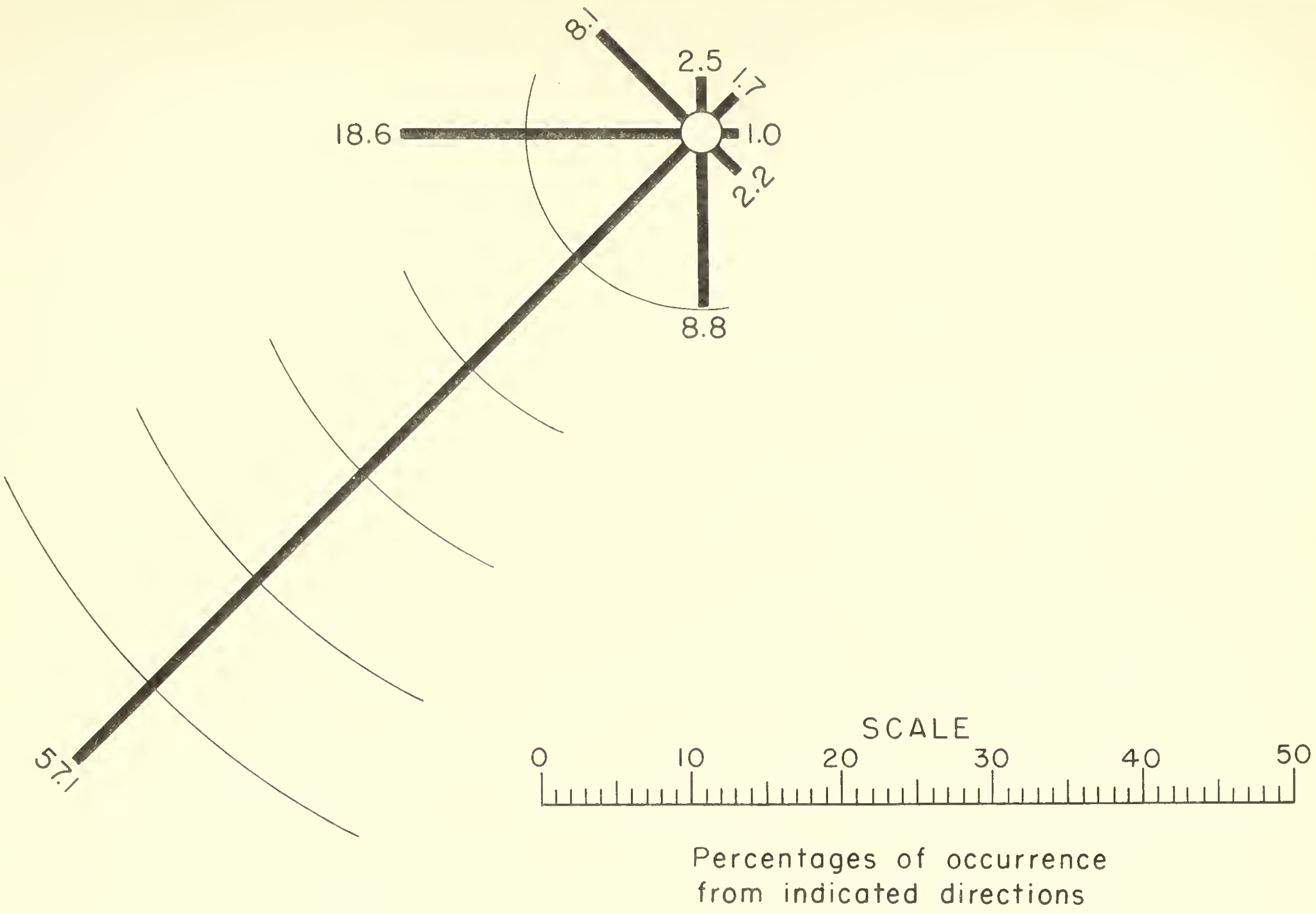

Figure 1.--Tornado rose for the United States, giving the percentage of tornadoes moving from the indicated directions during 1954.

TORNADO DATA

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons: Killed	Number of persons: Injured	Estimated damage: Property (exclusive of crops)	Estimated damage: Crops	Remarks
ALABAMA										
1. Feb. 28	2 a.m.	Chilton	NE	10	170	0	0	$5,000	$200	Major damages in Mt. Pleasant, New Salem, Collins Chapel, and Mineral Springs communities.
*2. March 13	8:40 p.m.	Russell	NE	1	880	0	0	15,300	0	Occurred at Fort Mitchell. Several barns and light frame houses destroyed. Crossed to Fort Benning, Ga.
3. March 29	2:30 p.m.	Henry	NE	1 1/2	100	0	0	10,000	0	In Headland community. Pilot saw large barn explode up into air. Trees uprooted, and several homes damaged, as well as several barns and a church.
4. April 16	8 a.m.	Coffee and Dale	NE	22	100	0	1	20,000	0	Storm only hit ground briefly at 2 points. First, a short path 2 miles east of Enterprise, Coffee County; second 3 miles east of Ozark, Dale County, 30 minutes later. 1 large and 3 small barns destroyed and 1 dwelling partly demolished.
*5. Dec. 5	1 p.m.	Lee	ENE	50	100	0	14	T✓ 140,000	C	Skipping path from 2 miles north of Opelika, Ala., to vicinity of Manchester, Ga. 11 houses destroyed; 64 damaged; 33 other buildings damaged; large chicken farm heavily damaged in Alabama.
*6. Dec. 5	1:30 p.m.	Calhoun	ENE	23	100	0	26	T✓ 200,000	C	Successively hit Ohatchee, Wellington, Angel Station, Merrellton, and Piedmont, with heaviest damage at Wellington. 37 houses destroyed, 48 damaged; 15 other buildings destroyed, 28 damaged. Moved into Georgia.
*7. Dec. 5	1:45 p.m.	Barbour	ENE	70	100	0	3	T✓ 3,000	C	Began between Clayton and Batesville, Ala., and followed a skipping path to near Ellaville, Ga.
8. Dec. 5	4 p.m.	Pike	ENE	1 1/2	70	0	2	T✓ 5,000	C	At Ansley 1 house destroyed, 3 others damaged; barn and 1 building and much hay destroyed, 4 other buildings damaged.
9. Dec. 5	Afternoon	Russell	(1)	(2)	(1)	0	(1)	9,000	0	Probable tornado, 15 miles west of Phenix City, 3 houses destroyed, and powerline downed; reported by pilot.
ARIZONA										
1. March 4	11:15-11:30 a.m.	Pima	(1)	(1)	(1)	0	0	0	0	Occurred at Tucson. Well-developed vortex appeared at base of dark clouds, with funnel reaching ground. Funnel well defined. Elevation of cloud base estimated at 5,000 feet above ground.
2. Aug. 5	11:48-11:58 a.m.	Yavapai	NE	(1)	(1)	0	0	0	0	Occurred 10 to 15 miles north-northwest of Chino Valley. Funnel cloud observed by Observer, WBAS, Prescott. The funnel observed for period of about 10 minutes. It appeared to disappear into cloud.
ARKANSAS										
1. Feb. 15	8:10-8:15 p.m.	Johnson	NE	1	100	0	24	325,000	0	68 buildings destroyed and 332 damaged in Clarksville and vicinity.
2. Feb. 15	10:10 p.m.	Sevier	(1)	(1)	150	0	0	(3)	0	Struck Kellum community; home and barn destroyed.
3. Feb. 16	2:30-2:35 a.m.	Mississippi	NE	2	880	1	4	50,000	0	Occurred at Chelford. Church, school, and 4 houses destroyed.
4. Feb. 19	3:45 p.m.	Jefferson	NE	1 1/4	150	0	1	20,000	0	Struck Sulphur Springs. 6 houses and 2 other buildings destroyed and 3 houses damaged.
5. Feb. 19	4:45-5:55 p.m.	Sebastian	NNE	1	33	0	0	700	0	Struck Greenwood and Camp Chaffee Reservation. 1 house damaged and 2 outbuildings destroyed.
6. Feb. 27	5:40 p.m.	Phillips	NE	3	400	0	0	5,000	0	Occurred southwest of West Helena. 2 large barns, tractor sheds, garage, and grain bin destroyed,
7. March 24	10:40-11:15 p.m.	Benton	NE	20	400	0	4	10,000	0	Storm moved from Centerton to Bentonville to Twelve Corners community. Several homes, barns, and outbuildings destroyed or damaged. Many chickens killed.
8. March 25	2:15 a.m.	Benton	(1)	(1)	(1)	0	0	5,000	0	Between Centerton and Hiwasse. Brooder house and other outbuildings and home damaged. 3,000 baby chickens killed.

See reference notes at end of table.

TORNADO DATA

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
ARKANSAS (Cont'd)										
9. April 10	12:30-1:25 p.m.	Bradley	NNE	21	100	0	0	$15,000	$ 0	Moved from Hermitage to Warren.
10. April 10	4:30 p.m.	Ashley	(1)	(2)	(4)	0	0	3,000	0	Occurred near Crossett. 1 farmstead damaged.
11. April 28	12:30 p.m.	Prairie	(1)	(2)	(4)	0	0	(5)	0	Funnel seen at Letchworth community, south of Des Arc.
*12. April 30	11 a.m.-noon	Miller, LaFayette, and Nevada	NE	45	50	0	0	10,500	0	Originated in Texas and moved into Arkansas; principal damage in Arkansas at Fouke and Boccaw.
*13. April 30	11 a.m.-12:54 p.m.	Little River, Howard, Pike, Clark, Hot Springs, and Garland	NE	95	(1)	0	2	200,000	0	Originated in Texas. Damage in Arkansas at Schall, Mineral Springs, Nashville, Bingen, west of Amity, Bismarck, and Hot Springs.
14. April 30	11:10 a.m.	Sebastian	(1)	(2)	(4)	0	0	2,000	0	Damage in south surburbs and southern sections of Ft. Smith to buildings and trees.
15. April 30	11:55 a.m.-12:25 p.m.	Crawford and Washington	NE	40	(1)	0	1	110,000	0	Path through Natural Dam, Greenland, Harris, and Goshen. Numerous poultry houses damaged in and around Goshen.
16. April 30	Noon	Pope	(1)	(2)	(4)	0	0	(3)	0	Struck near Atkins.
17. April 30	12:30 p.m.	Johnson	NE	12	100	0	0	16,000	0	Path from Hartman to west of Clarksville. Damage to several farmsteads. Brooder house damaged and 6,000 baby chicks lost.
18. April 30	3:15-4 p.m.	Lawrence and Greene	ENE	35	100	0	0	41,200	0	Path through Arbor Grove, Hoxie, and Beech Grove.
19. May 2	6:30-6:35 a.m.	Miller	NE	3	50	0	0	3,500	0	3 farms damaged.
20. May 2	9:15 a.m.	Clark	(1)	(2)	(4)	0	0	(3)	0	Reported at Okolona where 2 barns and other buildings damaged.
21. May 2	9:30 a.m.	Mississippi	(1)	(2)	(4)	0	0	3,000	0	Struck near Dell where several buildings damaged.
22. May 2	11 a.m.	Arkansas	(1)	(2)	(4)	0	0	(3)	0	Struck near Stuttgart. Tornado sucked concrete blocks supporting granary out of ground.
23. May 31	7:50 p.m.	Boone	(1)	(1)	(1)	0	0	0	0	Observed aloft over Harrison by several persons.
24. June 2	Night	Mississippi	(1)	(2)	(4)	0	1	6,000	0	11 houses damaged in vicinity of Tomato.
25. June 13	2-2:30 p.m.	Mississippi	(1)	2 1/2	880	0	0	14,000	0	Struck in vicinity of Sandy Bayou and Keiser where 4 barns damaged and grain bin carried some distance.
26. June 29	2:10-3:30 p.m.	Greene	SE	(2)	(4)	0	0	8,000	0	Struck Paragould.
27. July 8	6:30 p.m.	Scott	NE	1	100	0	0	4,000	0	Struck 3 miles west of Waldron. 2 barns badly damaged.
28. July 19	5:30 p.m.	Cleveland	ENE	2	(4)	0	0	1,000	0	Did not touch ground, but dipped down to damage tops of 2 houses at Kingsland.
29. Aug. 29	10:30 p.m.	Sevier	NW	7	30	0	0	18,000	0	Path from Ben Lomonn to Lockesburg; touched ground 4 times. 2 homes and 6 other buildings damaged.
CALIFORNIA										
1. June 25	2-4:30 p.m.	San Bernardino	N	(1)	(1)	0	0	10,000	0	8 1/2 miles northwest of Victorville, home destroyed in path of large, black, funnel-shaped cloud. Frame houses, garages, and other buildings damaged in Bell Mountain district.
COLORADO										
1. Feb. 13	7:43-7:49 a.m.	Custer	NE	[6]900	10	0	0	2,000	0	Destroyed 3 farm buildings at Westcliffe. Scattered debris over area of about 1/4 square mile.
2. March 24	1-1:05 p.m.	Logan (SE)	NE	12	(1)	0	1	5,000	0	3 funnel clouds observed.
3. March 24	1-1:05 p.m.	Logan (SE)	NE							
4. March 24	1-1:05 p.m.	Logan (SE)	NE							
5. March 31	1 p.m.	Washington	(1)	(1)	(1)	0	0	0	2,000	Occurred near Otis. Moderate hail accompanied storm.
6. March 31	1 p.m.	Yuma	(1)	(1)	(1)	0	0	1,000	0	Damage limited to small buildings and roofs at Yuma.
7. April 19	11:30 a.m.	Denver	(1)	[6]50	15	0	0	500	0	Probably a large "dust devil."
8. April 25	(1)	Adams	(1)	[6]40	10	0	0	100	0	At Brighton, damaged roof of house.
9. May 16	5 p.m.	Las Animas	(1)	(1)	(1)	0	0	0	0	25 miles southeast of Trinidad. In sparsely populated area.
10. June 6	1:30 p.m.	Douglas	NE	[6]135	7	0	0	300	0	3 miles west of Parker. 2 sheds demolished. Position of debris indicated tornado.
11. June 19	5 p.m.	Weld	NE	[6]60	10	0	0	100	0	10 miles west of Grover. Uprooted trees and damaged homes.
12. July 28	Afternoon	Adams	(1)	(1)	(1)	0	0	(3)	(3)	10 miles northeast of Byers. Destroyed machine shed and garage; damaged house, cars, truck, and boat.

See reference notes at end of table.

TORNADO DATA

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons: Killed	Number of persons: Injured	Estimated damage: Property (exclusive of crops)	Estimated damage: Crops	Remarks
COLORADO (Cont'd)										
13. Aug. 7	Afternoon	Larimer	(1)	2	(1)	0	0	$ (3)	$ (3)	Storm in isolated forested area. Damage to standing timber near Deadman Hill.
CONNECTICUT										
1. May 10	9:20 a.m.	Tolland	(1)	1/4	35	0	2	$20,000	$1,000	Occurred near Pinney and Windsorville sections about 2 1/2 miles southwest of center of Ellington. 8-room house, barn, and 3 tobacco sheds demolished. Tornado made up of 3 or 4 funnel-shaped clouds; preceded and attended by heavy hail and rain.
2. May 10	12:55 p.m.	Hartford	(1)	3/4	50-100	0	0	1,000	0	Occurred at East Hartland. Poorly developed tornado, not associated with tornado at Ellington. Path almost entirely above ground at about tree-top level. Damage to trees and roof, also to a few tents at Girl Scout Camp; small garage demolished.
DELAWARE										
1. July 1	5 p.m.	New Castle	ENE	1	100	0	0	2,000	(5)	Demolished 1 building, moved another, and uprooted trees at Middletown.
FLORIDA										
1. Jan. 9	(1)	Palm Beach	(1)	(1)	(1)	0	0	0	0	2 funnel clouds near West Palm Beach Airport.
2. Jan. 9	(1)	Palm Beach	(1)	(1)	(1)	0	0	0	0	
3. Feb. 20	Night	Santa Rosa	(1)	(1)	(1)	0	0	(5)	0	Near Jay. Demolished small frame residence.
4. April 3	Afternoon	Dade	(1)	(1)	(1)	0	0	0	0	Funnel cloud above Marine Air Station at Miami and waterspout moved ashore from Atlantic. Associated with same thunderstorm.
5. April 3	Afternoon	Broward	(1)	(1)	(1)	0	0	0	0	Funnel cloud west of Pompano Beach.
6. April 16	7:30 a.m.	Washington	NE	(1)	(1)	0	0	0	0	Funnel cloud at Crystal Lake.
7. April 16	Morning	Bay	(1)	2	(1)	0	3	10,000	0	Path not continuous. House trailer and 4 buildings destroyed and 15 homes damaged at Millville.
8. April 16	3:30 p.m.	Gulf	(1)	(1)	(1)	0	0	(5)	0	Damaged roofs and broke windows at Port St. Joe.
9. April 30	3 p.m.	Polk	W	(1)	(1)	0	0	1,000	0	Roofs damaged and trees broken at Bartow.
10. May 20	Morning	Indian River	(1)	(1)	(1)	0	0	0	0	Waterspout 10 miles northeast of Vero Beach.
11. June 3	4 p.m.	Flagler	SE	(1)	(1)	0	0	0	0	3 waterspouts offshore,
12. June 3	4 p.m.	Flagler	SE	(1)	(1)	0	0	0	0	southeast of Flagler Beach.
13. June 3	4 p.m.	Flagler	SE	(1)	(1)	0	0	0	0	
14. June 10	3:30 p.m.	Suwannee	(1)	2	(1)	0	1	25,000	0	Occurred at Mc Alpin. Store building destroyed and 6 homes damaged. Accompanied by heavy hail.
15. June 18	Late afternoon	Monroe	(1)	(1)	(1)	0	0	0	0	Heavy squall line off Lignumvitae Key developed 11 waterspouts, visible simultaneously. At least 5 reached surface of water.
16. June 18	Late afternoon	Monroe	(1)	(1)	(1)	0	0	0	0	
17. June 18	Late afternoon	Monroe	(1)	(1)	(1)	0	0	0	0	
18. June 18	Late afternoon	Monroe	(1)	(1)	(1)	0	0	0	0	
19. June 18	Late afternoon	Monroe	(1)	(1)	(1)	0	0	0	0	
20. June 18	Late afternoon	Monroe	(1)	(1)	(1)	0	0	0	0	
21. June 18	Late afternoon	Monroe	(1)	(1)	(1)	0	0	0	0	
22. June 18	Late afternoon	Monroe	(1)	(1)	(1)	0	0	0	0	
23. June 18	Late afternoon	Monroe	(1)	(1)	(1)	0	0	0	0	
24. June 18	Late afternoon	Monroe	(1)	(1)	(1)	0	0	0	0	
25. June 18	Late afternoon	Monroe	(1)	(1)	(1)	0	0	0	0	
26. June 23	Afternoon	Dade	E	(1)	(1)	0	0	0	0	Funnel existed under thunderstorm cloud 18 minutes and reached ground in a pasture 15 miles northbwest of Miami.
27. June 28	Afternoon	Dade	(1)	(1)	(1)	0	0	"	0	Funnel cloud east of Homestead.
28. July 7	8:45 a.m.	Lee	(1)	(1)	(1)	0	0	"	0	Waterspout over Caloosahatchee River at Fort Myers.

See reference notes at end of table.

TORNADO DATA

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
FLORIDA (Cont'd)										
29. July 8	1 p.m.	Palm Beach	(1)	(1)	(1)	0	0	$ 0	$ 0	Funnel cloud appeared to reach ground 20 miles west of Delray Beach.
30. July 11	(1)	Broward	(1)	(1)	(1)	0	0	0	0	Waterspout observed from Fort Lauderdale over ocean.
31. July 28	7 p.m.	Palm Beach	(1)	(1)	(1)	0	0	0	0	2 waterspouts off West Palm Beach.
32. July 28	7 p.m.	Palm Beach	(1)	(1)	(1)	0	0	0	0	
33. Aug. 10	5:32 p.m.	Palm Beach	(1)	(1)	(1)	0	0	0	0	Funnel cloud observed 5 miles west of West Palm Beach, did not reach ground.
34. Aug. 11	1 p.m.	St. Lucie	E	(1)	(1)	0	0	(5)	0	2 light airplanes severely damaged at Fort Pierce.
35. Aug. 20	6:45 p.m.	Pinellas	S then E	6 500	25	0	0	10,000	0	Waterspout damaged hotel building at Pass-A-Grille.
36. Sept. 18	2 a.m.	St. Lucie	(1)	(2)	(4)	2	2	(5)	0	Small home demolished at Fort Pierce.
37. Sept. 22	3:30 p.m.	Brevard	N	(2)	90	0	0	0	0	Passed near Merritt Island Airport.
38. Sept. 22	5 p.m.	Broward	NE	(2)	35	0	5	(5)	0	Damaged 5 houses and an automobile at Hollywood.
39. Sept. 22	5 p.m.	Broward	(1)	(1)	(1)	0	0	0	0	Waterspout observed northeast of Fort Lauderdale.
40. Sept. 24	2:20 p.m.	Broward	(1)	(1)	(1)	0	0	0	0	Waterspout observed southwest of Fort Lauderdale.
41. Oct. 7	1 p.m.	St. Johns	(1)	(1)	(1)	0	0	0	0	Waterspout off St. Augustine Beach.
42. Nov. 18	4:45 p.m.	Highlands	ESE	(1)	(1)	0	0	0	0	Funnel cloud observed 5 miles southwest of Lake Placid.
GEORGIA										
*1. March 13	9:40-9:45 p.m.	Chattahoochee	ENE	10	100-600	2	20	6,000,000	0	Originated in Alabama, moving over 4-mile length in Georgia through heart of Lawson Air Base and Fort Benning military post. Terrific twisting winds up to 120 m.p.h. blew down 250-foot parachute-jump tower with great destruction of housing units, military buildings, airplanes, and inside furnishings; military activities badly disrupted with fallen trees and broken utility lines littering entire path of storm.
2. March 13	10-11:35 p.m.	Taylor, Crawford, and Bibb	ENE	50	100-500	5	75	3,175,000	(5)	Began near Howard community, continuing through Mizell, Crowell, Roberta, Knoxville, Sewell, Lizella, and through center of Macon. Very heavy losses concentrated in Macon where 100 homes demolished, 650 others damaged, and other damages, inconveniencing more than 3,000 families. Prior to reaching Macon, storm destroyed or damaged more than 150 homes and other property, causing considerable confusion and disruption of utility services.
3. March 13	10:30 p.m.	Taylor	ENE	3-4	100-400	0	0	7,500	(5)	Struck first in Turner Chapel community, destroying 2 homes and damaging several other buildings, then continuing short distance beyond Ficklin's mill where only moderate damages occurred.
4. March 13	10:30-11:45 p.m.	Taylor, Crawford, Peach, Houston, and Twiggs	ENE	30-35	100-500	1	5	20,000	(5)	Began near Reynolds, passing mostly through wooded and pasture lands, with moderate to heavy damages concentrated near Byron and at Centerville, Elberta, and Bullard.
5. March 31	3:30 p.m.	Hall	E	(2)	400	0	0	30,000	(5)	Funnel cloud observed as storm struck locally at poultry farm, 5 miles north-northwest of Gainesville, causing considerable damage to timber, destroying 2 poultry houses, and killing 3,000 chickens, and other damage.
6. March 31	4:15-4:30 p.m.	Madison and Elbert	E	18	200	0	25	300,000	(5)	Struck first at Danielsville with moderate damages, then lifted and struck again in Dewey Rose community where school building and 2 homes demolished and heavy damages done to other buildings including 2 cows and 4,000 chickens killed.
7. April 8	4 p.m.	Dawson	E	5 1/2	200	0	0	25,000	(5)	Occurred largely through rural sections southwest of Dawson, causing heavy timber losses and moderate to heavy losses to several homes and other buildings over well-defined path.
8. April 16	1:30 p.m.	Peach	E	(1)	(1)	0	0	1,500	0	Indistinct path and concentration of damages at roof levels indicate tip of storm not quite reaching ground. Damages affected several homes, smaller buildings, trees, utility lines, and smaller exposed property, mostly at Fort Valley.

See reference notes at end of table.

TORNADO DATA

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
GEORGIA (Cont'd)										
9. April 16	1:40 p.m.	Dodge	E	2	(1)	0	0	$2,000	$ 0	Moved through Eastman with spotty damage largely confined to roofs, wire lines, and trees, with twisting wind characteristics observed.
10. June 3	3 p.m.	Wilkes	E	2	(1)	0	2	7,500	500	7 miles north of Washington pillar-like cloud observed; storm moved hop and skip fashion. Damages occurred at 3 locations along Tignall-Sandtown Road, involving heavy damages to several buildings and destruction of some crops and rose garden.
11. July 4	Afternoon	Franklin	NE	(1)	800	0	0	2,800	(5)	Local storm near Lavonia destroyed a barn and 2 poultry houses and damaged other buildings and property.
12. July 24	Late evening	Dougherty	NE	(1)	(1)	0	0	2,500	0	Reported as sounding like "bunch of jets flying over." Storm restricted to small area in Albany, where trees and TV antennas heavily damaged by high winds and 6 homes damaged by lightning.
13. Aug. 16	10:30 p.m.	Monroe	(1)	(1)	(1)	0	0	6,000	0	Tornadic storm of small proportions near Culloden demolished 2 garages, heavily damaged another, and wrecked a barn; another barn destroyed by fire ignited by lightning.
14. Aug. 17	3:30 p.m.	Richmond	E	(1)	(1)	0	0	10,000	0	Tornadic winds wrecked auto repair shop and private garage and damaged trees, wire lines, roofs of houses and other property at Augusta.
15. Aug. 17	5 p.m.	Appling	E	1/2	(1)	0	0	1,500	0	Small storm unroofed warehouses, broke windows and trees, and damaged roofs with some utility lines downed at Baxley.
*16. Dec. 5	1:30 p.m.	Harris and Meriwether	ENE	30	100-300	0	3	150,000	(5)	Clearly defined path originating in Alabama. Crossed Chattahoochee River at Bartletts Ferry, moving through Mountain Hill and Blue Springs communities, also Pine Mountain Valley and Manchester with greatest losses at Manchester. More than 125 homes and many smaller buildings and other property damaged; 12 or more homes and numerous smaller buildings destroyed; inside furnishings damaged by rain through broken roofs; trees and wire lines blown down throughout path with service disruptions.
17. Dec. 5	1:30-2 p.m.	Early	ENE	7	100-400	0	0	12,000	2,000	Grazed northern extremity of Blakely, cutting path through swamp to Bancroft; 6 homes and a church badly damaged or destroyed, truck crumpled, stored crops blown away, and some disruption of utility services.
*18. Dec. 5	3:30-4:15 p.m.	Stewart, Webster, and Schley	ENE	30-35	100	1	32	170,000	10,000	Probably originated in Alabama, moving in Georgia through Shady Grove, Pleasant Valley, Red Hill, Church Hill, and Ebenezer communities, and through Ellaville. Funnel cloud and rumbling sound observed. Fire watchtower blown down and several buildings damaged at Shady Grove; church and several smaller buildings destroyed at Pleasant Valley; 2 homes and a few other buildings demolished with considerable damage to 4 automobiles and farm equipment at Red Hill; 1 home, a church, and several other buildings heavily damaged at Church Hill; 5 homes and several other buildings heavily damaged in Ebenezer; several homes and other structures demolished at Ellaville, and a number of pecan trees blown down. Moderate to heavy crop and timber damage with many trees and utility lines downed throughout storm path.
19. Dec. 5	4 p.m.	Douglas	(1)	(1)	(1)	0	0	2,500	(5)	Moderate to heavy damages over short path to 4 homes and 3 other buildings and other property.
20. Dec. 5	4-4:10 p.m.	Talbot	E	4	60-100	0	7	4,500	500	Moved through Philadelphia Church area near Red Bone community, demolishing 2 homes with moderate to heavy damages to several other buildings; some crops in storage blown away.

See reference notes at end of table.

TORNADO DATA

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
GEORGIA (Con't)										
21. Dec. 5	4-4:30 p.m.	Marion	ENE	7	150	0	2	$34,800	$3,000	Moved mostly through rural areas, also through Buena Vista; timber losses heavy, home destroyed, and 3 heavily damaged with moderate to heavy damages to several other buildings; much feedstuff blown away.
*22. Dec. 5	4-4:30 p.m.	Bartow	ENE	8	100-800	0	0	45,000	5,000	Originated in Alabama, occurring in Georgia from Taylorsville to Stilesboro. Demolished 3 warehouses, 2 homes, 6 barns, and blew down power substation and high-line steel tower; also heavy damages to several homes and other structures and a peach orchard; trees and utility lines blown down.
23. Dec. 5	4:30-5 p.m.	Carroll	ENE	3-5	200	0	0	25,000	(5)	Occurred between Sandy Hill and Hulett, most damages at Sandy Hill. Demolished church, 2 garages, and numerous small buildings with extensive minor to moderate damages to property.
24. Dec. 5	5:15 p.m.	Fulton	ENE	1/2	50	0	0	25,000	0	Dipped into ravine near Fort McPherson in Atlanta, demolishing home and inflicting heavy damages to 6 homes, 2 automobiles, and several carports. Number of trees blown down, some snapped off 10 feet above ground, and substantial service disruption from broken utility lines.
25. Dec. 5	5:10 p.m.	Terrell	ENE	2-3	50-300	0	0	20,000	1,000	Affected trading center and 3 farms near Dawson (Yeomans community). Home and several smaller buildings demolished, heavy damage to a store and numerous small buildings; considerable crops in storage blown away and numerous trees and utility lines blown down.
26. Dec. 5	5:30-6 p.m.	Early	ENE	1-3	100	0	0	5,000	500	Path of storm mostly through rural section, also through Lucile community where 3 homes and a barn demolished and several other buildings damaged; some stored crops blown away.
IDAHO										
1. April 28	12:20 p.m.	Butte	E	(1)	(1)	0	0	0	0	Near National Reactor Testing Station. Slender funnel-shaped appendage from cloud visible about 5 minutes.
2. June 9	1:10-1:17 p.m.	Butte	(1)	(1)	(1)	0	0	0	0	Slender funnel-shaped cloud observed 15 miles northeast of National Reactor Testing Station. No apparent horizontal motion observed.
3. June 9	Afternoon	Fremont	(1)	1/4	70	0	0	5,000	0	Twister near Lamont not witnessed, but damage to barn and 2 combines reported with distribution of debris indicating circular motion of storm.
ILLINOIS										
1. March 12	6 p.m.	Sangamon, Menard, and Logan	NE	40	(1)	0	3	250,000	0	Moved from Pleasant Plains to Lincoln. Damage mostly in rural areas of Lincoln..
2. April 7	3-3:50 p.m.	Livingston and Kankakee	NNE	45	400	1	13	246,000	0	Tornado first touched ground near Saunemin, lifted, but touched ground again in southwestern Kankakee County, then moved across village of Indian Oaks. 8 homes destroyed, 30 damaged; 30 other buildings destroyed and 46 damaged. Bell-shaped funnel cloud observed.
3. May 27	6:30-6:45 p.m.	Kendall	NE	7	200	0	0	30,000	0	Unroofed 8 homes, uprooted and damaged many trees, broke power and telephone lines, and caused other miscellaneous damage in Aurora.
4. May 28	6:15-6:35 p.m.	Woodford	(1)	(2)	(4)	0	0	15,000	0	Damage on 5 farms 3 miles northwest of Eureka.
5. May 31	3:15-3:45 p.m.	Iroquois	NNE	23	400	0	2	60,000	0	Damage intermittent on path from 4 1/2 miles west of Delrey to 1 mile south of Chebanse. Damage on 10 farms, 7 in Clifton area, and 1 building in Clifton. Extensive damage in and near Onarga and Clifton. 3 hogs killed and 6 cows injured.
6. July 14	6:45-7:30 p.m.	Fayette	NNE	25	200	0	1	60,000	0	Moved from vicinity of Pittsburg to 4 miles southeast of Herrick. Damage along route included County Club at Vandalia, plate glass blown out, 2

See reference notes at end of table.

TORNADO DATA

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons Killed	Number of persons Injured	Estimated damage Property (exclusive of crops)	Estimated damage Crops	Remarks
										buildings unroofed, trees uprooted, 3 barns and several small buildings destroyed, 6 head of cattle killed.
ILLINOIS (Cont'd)										
7. Oct. 10	4 p.m.	Cook	(1)	1 1/2	50	0	0	$10,000	$ 0	Occurred at Homewood; damaged trees and caused minor structural damage to dwelling, and scattered lumber in large lumberyard.
INDIANA										
1. March 12	11 p.m.	Vigo	NNE	(1)	(1)	0	0	100	0	1 1/2 miles southwest of Pimento. Chicken house demolished and doors torn from nearby barn. At least 2 persons heard roar of approaching tornado.
2. March 19	(1)	Fayette	(1)	(1)	(1)	0	0	10,000	0	Roofs severly damaged on 3 or 4 houses and a church in Connersville.
3. March 19	(1)	Clinton	E	(1)	(1)	0	0	1,500	0	2 trucks blown across road,1 completely wrecked at Kirklin.
4. March 28	4:50 p.m.	Madison	ESE	1 1/2	35-70	0	2	750,000	0	In Anderson homes twisted from foundations, several homes flattened, roofs and packing plant badly damaged. Storm moved through residential and business section. Funnel and roar reported by many persons.
5. April 6	A.m.	Knox	(1)	(1)	25	0	0	4,000	0	At Wheatland winds unroofed 2 or 3 buildings, dropping roof of 1 on truck and damaging it.
6. April 6	5 a.m.	Pike	(1)	(1)	(1)	0	0	5,000	0	At Glezon, 5 miles south of Petersburg, store roof damaged. 2 porches of 2 homes carried away and much of roof from 1 home; 2 barns damaged. Hail broke a few windows.
7. April 6	7 a.m.	Dubois	NE	4	(1)	0	0	8,000	0	At Ferdinand roofs of church and several homes damaged; 2 garages and 2 barns also damaged.
8. April 6	P.m.	Pike	(1)	(1)	(1)	0	0	800	0	Poultry house destroyed in Petersburg.
9. April 7	5:50 p.m.	Noble	(1)	(1)	(1)	0	0	30,000	0	At Kendallville barns, outbuildings, and trees flattened; livestock and chickens killed.
10. April 7	6 p.m.	Noble	(1)	(1)	(1)	0	0	0	0	A small tornado 4 miles northeast of Albion.
11. May 2	1:15 p.m.	Porter	WNW	(1)	(1)	0	0	0	0	2 waterspouts over Lake Michigan, 6 to 8 miles north of Ogden Dunes, lasting about 5 minutes; 1 spout elongated horizontally for most of its length, with several bends in it before it curved sharply downward to Lake.
12. May 2	1:15 p.m.	Porter	WNW	(1)	(1)					
13. May 27	(1)	Newton	(1)	(1)	(1)	0	0	(3)	0	Suspected tornado in northern portion of County.
14. May 28	(1)	Newton	(1)	(1)	(1)	0	0	(3)	0	Suspected tornado in northern portion of County.
15. May 31	2 p.m.	Marion	(1)	(1)	(1)	0	0	300	0	Small funnel-shaped cloud observed at Indianapolis. Tree picked up and dropped on truck.
16. May 31	4 p.m.	Newton	(1)	(1)	(1)	0	1	26,300	0	Numerous barns and other buildings damaged or destroyed. Area affected was north of Kentland and in Brook and Morocco communities.
17. May 31	6:30 p.m.	Miami	(1)	(1)	(1)	0	0	3,200	0	Suspected tornado unroofed 2 barns, overturned crib, and downed trees in Chili.
18. June 1	2 a.m.	Benton	(1)	(1)	(1)	0	0	3,000	0	Suspected tornado at Wadena raised roof of school building about 6 inches and broke windows on west side, also stripped limbs from trees.
19. June 1	2 a.m.	Lake	(1)	(1)	(1)	0	0	8,000	0	At Lake Village Airport, suspected tornado tore roof off hangar and damaged a number of airplanes.
20. June 1	2:30 a.m.	Pulaski	NE	(1)	(1)	0	0	500	0	Suspected tornado in vicinity of Winamac. Completely demolished chicken house, uprooted shrubbery, and downed trees.
21. June 1	3 a.m.	Marshall	(1)	(1)	(1)	0	0	2,000	0	Suspected tornado at Argos moved barn off foundation, picked up 2 brooder houses and hen house, carried them about 650 feet and demolished them.
22. June 1	Early a.m.	White	(1)	(1)	(1)	0	0	1,000	0	Suspected tornado at Monon damaged cement-block garage and uprooted trees.
23. June 1	(1)	Elkhart	(1)	(1)	(1)	0	1	1,000	0	Suspected tornado 17 miles northeast of Goshen damaged home.
24. June 12	(1)	St. Joseph	(1)	(1)	(1)	0	0	1,000	0	Suspected tornado 8 miles southeast of South Bend picked up crib in which 5 persons had sought shelter from rain and carried it 500 feet with its occupants.
25. June 13	4:30 p.m.	Marion	(1)	(1)	(1)	0	0	600	0	Suspected tornado at Indianapolis picked up hen house and deposited it in tree.
26. June 14	P.m.	Jasper	(1)	(1)	(1)	0	0	500	0	Funnel cloud touched ground briefly a few miles north of Remington.

See reference notes at end of table.

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
INDIANA (Cont'd)										
27. June 17	Afternoon	Delaware	(1)	(1)	(1)	0	0	$ (3)	$ 0	Suspected tornado at Muncie ripped roof from warehouse, permitting rain to wash through stored commodities.
28. June 19	6:30-7:30 p.m.	Jasper	(1)	(1)	(1)	0	0	(5)	0	Trees damaged by suspected tornado 10 miles north of Rensselaer.
29. June 21	3 p.m.	Whitley	(1)	(1)	(1)	0	0	2,000	0	Suspected tornado 1 mile north of Big Lake damaged barn and outbuildings.
30. June 26	8 p.m.	Morgan	(1)	(1)	(1)	0	0	5,000	0	Suspected tornado in Eminence and vicinity damaged barn, home, and gymnasium, also downed trees and poles.
31. July 1	Late afternoon	Pike	(1)	(1)	(1)	0	0	1,500	500	Suspected tornado 4 miles west of Petersburg unroofed building, damaged corn, and broke trees.
32. July 20	9 p.m.	Hendricks	(1)	(1)	(1)	0	0	12,000	0	Suspected tornado in Plainfield and vicinity completely leveled new barn, killed 2 sheep, uprooted trees, and demolished chicken house.
33. Aug. 1	(1)	Orange	(1)	(1)	(1)	0	0	1,500	0	Suspected tornado at Paoli unroofed several farm buildings and damaged brooder house.
34. Oct. 11	2:15 p.m.	Johnson	NE	5	100	2	10	200,000	0	About 4 miles west-southwest of Franklin, church destroyed and 2 homes damaged. Then struck near western edge of Franklin leveling barn and injuring several persons. Crossed highway and completely destroyed home and barn and fatally injured 2 persons also damaged 30 more homes.
IOWA										
*1. April 5	5:30-6:45 p.m.	Page	NE	5	440-880	0	2	318,000	0	Family of 4 tornadoes. From 2 1/2 miles north of Westboro, Mo., to 1/2 mile southeast of Northboro.
2. April 5	5:30-6:45 p.m.	Page	NE	(2)	(1)	0			0	3 miles east-southeast of Northboro.
*3. April 5	5:30-6:45 p.m.	Page and Taylor	NE	18	(1)	0			0	Intermittent beginning in Atchison County, Mo., to 2 miles north of Siam, continuing 5 miles into East Mason Township.
4. April 5	5:30-6:45 p.m.	Taylor	NE	(2)	(1)	0			0	1/2 mile north of Bedford. Damage above for all 4 tornadoes (6 farmsteads completely demolished; homes damaged and barns or other buildings demolished on 20 farmsteads; minor damage on 28 other farmsteads during passage of these tornadoes).
5. April 5	5:10 p.m.	Greene	NNE	7	880	0	1	100,000	0	Path from 1/4 mile east of Scranton to 2 miles northwest of Farlin. Funnel cloud observed. Severe damage to 5 farmsteads, major damage on 13 other farmsteads.
6. April 26	5:25 p.m.	Clay	SSE	9	(4)	0	0	500	0	4 funnel clouds observed traveling from vicinity of Royal to vicinity of Cornell. Damage to farm buildings in vicinity of Rossie.
7. April 26	5:25 p.m.	Clay	SSE			0	0		0	
8. April 26	5:25 p.m.	Clay	SSE			0	0		0	
9. April 26	5:25 p.m.	Clay	SSE			0	0		0	
10. April 26	7:30 p.m.	Scott	SSE	(2)	(4)	0	0	1,000	0	Damaged buildings and killed 1 cow on farm 3 1/2 miles north of New Liberty.
*11. April 30	3:15 p.m.	Van Buren, Lee, Jefferson, Henry, Des Moines, Washington, Louisa, Johnson, Muscatine, and Cedar	NNE	180	440	1	9	1,240,000	0	Family of 5 tornadoes. 1. Moved from vicinity of Sturgeon, Mo., to 3 miles southwest of Lowden. Forward movement 60 m.p.h. 1 death occurred from this tornado. Path touched Franklin, Lee County, and Mt. Union, Henry County.
12. April 30	7-8:30p.m.	Linn, Delaware, Clayton, and Allamakee	NNE	85	(1)				0	2. Intermittent from small community of Linn Grove, Linn County, to Garber, Clayton County, thence to Wine's Landing near Harper's Ferry, Allamakee County.
13. April 30	7:05-7:30 p.m.	Jones and Dubuque	NNE	20	(1)				0	3. Intermittent from 1 mile south of Monticello to 3 miles southeast of Dyersville; greatest damage in Worthington and Dyersville. 8 farmsteads damaged.
14. April 30	7:30 p.m.	Buchanan	NNE	(2)	(1)				0	4. 3 1/2 miles north of Lamont, demolished farmstead.
15. April 30	(1)	Iowa, Benton, Linn, and Delaware	NNE	70	(1)				0	5. Touched ground occasionally from extreme southeastern Iowa County to 1 mile east of Delaware, Delaware County; most severe damage to farming community 6 miles southeast of Ryan, Delaware County.

See reference notes at end of table.

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
IOWA (Cont'd)										
								$	$	Damage listed above for all 5 tornadoes. 114 farmsteads, homes, or buildings damaged in these tornadoes. Loss of livestock heavy, including 100 bogs on farm near Letts, Louisa County.
16. May 23	6 p.m.	Mitchell	(1)	(1)	(1)	0	0	1,500	0	Occurred at Osage. Destroyed machinery shed, windmill, and pumphouse. Minor damage to nearby farms.
17. May 23	8:15 p.m.	Linn	(1)	(1)	(1)	0	0	1,000	200	Occurred at Ely. Destroyed machine shed and hen house, and damaged house and brooder house. Unroofed corn crib and uprooted trees.
18. May 27	8 p.m.	Plymouth	NE	3	(1)	0	0	20,000	(3)	Destroyed buildings on 4 farms at Oyens. Funnel clouds observed an hour earlier 30 miles southwest in vicinity of Sioux City.
19. June 9	10-11 p.m.	Calhoun	NE	9	440	1	0	200,000	(3)	Moved from northeast of Lake City to southeast of Rockwell City, damaging or destroying buildings on 6 farmsteads. Farmer sleeping in 1 house killed.
20. June 19	9 p.m.	Lyon and Sioux	NE	3	880	0	0	10,000	(3)	Destroyed buildings on 3 farmsteads.
21. Aug. 22	3:30 p.m.	Clay	(1)	2 1/2	200	0	0	10,000	(3)	Destroyed farm buildings and crops at Everly.
KANSAS										
1. Feb. 19	3:45 p.m.	Sedgwick	SE	(1)	(1)	0	0	0	0	Small tornado clearly seen aloft near Sedgwick-Reno County line.
2. March 11	5:55 p.m.	Osborne	NE	(1)	(1)	0	0	1,000	0	1 1/2 miles northeast of Osborne, buildings on 1 farm damaged and trees uprooted.
3. March 12	12:20 p.m.	Atchison	(1)	(1)	(1)	0	0	1,200	0	6 miles southeast of Horton, damaged barns, blew windows out of bouse, and uprooted fruit trees on 1 farm.
4. March 18	10:30 a.m.	Sumner	(1)	(1)	(1)	0	0	1,000	0	3 miles northeast of Conway Springs, barn destroyed.
5. March 18	11 a.m.	Marion	(1)	(1)	(1)	0	0	(5)	0	Possible tornado 4 miles west of Durbam. Spot damage along squall line.
6. March 18	11:15 a.m.	Dickinson	NE	(1)	(1)	0	0	5,000	0	At least 3 funnels sighted in Herington area, 1 touched ground.
7. March 18	11:15 a.m.	Dickinson	NE	(1)	(1)					
8. March 18	11:15 a.m.	Dickinson	NE	(1)	(1)					
9. March 18	11:35 a.m.	Geary	(1)	2	440	0	0	1,700	0	4 miles west of Junction City, farm buildings damaged; debris indicated tornado.
10. March 18	11:55 a.m.	Chase	(1)	(1)	(1)	0	0	(5)	0	At Cottonwood Falls, possible tornado; damage to grandstand suggests tornado, but no funnel sighted.
11. March 18	12:15 p.m.	Lyon	(1)	2	440	0	0	300	0	3 miles south of Allen, barn destroyed; funnel sighted.
12. March 18	12:25 p.m.	Wabaunsee	(1)	(1)	(1)	0	0	1,000	0	7 miles south of Eskridge, barn destroyed; funnel not seen, but damage indicated tornado.
13. March 18	12:30 p.m.	Lyon	(1)	(1)	(1)	0	0	500	0	6 miles south of Harveyville, farm buildings destroyed; damage indicated tornado.
14. March 18	1:10 p.m.	Shawnee	(1)	(1)	(1)	0	0	5,000	0	1 mile north of Wakarusa.
15. March 18	1:15 p.m.	Osage	(1)	(1)	(1)	0	0	1,000	0	Near Overbrook, farm buildings damaged; debris indicated tornado.
16. March 18	1:15 p.m.	Brown	(1)	2 1/2	133	0	0	500	0	At Hiawatha, funnel seen and roar beard.
17. March 18	1:30 p.m.	Jefferson	(1)	(1)	100	0	0	(3)	0	3 1/2 miles south at Wincbester, several farm buildings destroyed.
18. March 18	(1)	Riley	(1)	1/4	33	0	0	2,500	0	15 miles northwest of Manhattan, farm buildings destroyed; damage indicated tornado.
19. March 18	(1)	Brown	(1)	(1)	(1)	0	0	(3)	0	Damage to aircraft at airport at Horton suggests tornado.
20. March 24	3:55 p.m.	Sedgwick	NNE	(1)	(1)	0	0	0	0	Report of tornado aloft 4 miles south of Cbeney.
21. March 24	8:30 p.m.	Franklin (NE), Douglas (SE), and Miami (NW)	NE	(1)	(4)	0	0	2,000	0	At least 3 farms suffered damage to barns and sheds.
22. March 24	9 p.m.	Wilson (NE), Neosho (NW), and Allen (SW)	NE	20	880	0	0	7,000	0	Local damage to farm buildings probably from incipient tornado in Wilson County. Path of damage discernible from air from 4 miles northwest of Chanute into Allen County.
23. March 24	9:30 p.m.	Labette	E	2	440	0	0	15,000	0	5 1/2 miles southwest of Cherryvale; cloud observed to rise and lower as it moved to destroy or damage buildings and uproot trees on several farms.
24. March 24	9:45 p.m.	Cherokee	(1)	(1)	17	0	0	(3)	0	Possible tornado; farm buildings destroyed near Columbus.
25. April 5	6:45 p.m.	Riley	NE	9	(1)	0	0	(3)	0	2 funnels observed north of Milford, 1 dipping to ground damaged farmstead.
26. April 5	6:45 p.m.	Riley	NE			0	0		0	

See reference notes at end of table.

Table 11—Continued

TORNADO DATA

Year 1954

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
KANSAS (Cont'd)										
27. April 5	7:30 p.m.	Jackson	ESE	5	100	0	0	$5,000	$ 0	10 miles south of Soldier, definite path of tree and building damage in rural area.
28. April 10	6:30 p.m.	Coffey	N	(1)	(1)	0	0	2,200	0	5 1/2 miles southeast of Waverly, wrecked barns and sheds on 2 farms.
29. April 25	12:40 a.m.	Ellsworth	N	(1)	(1)	0	0	(3)	0	Probable tornado north of Holyrood, ripped roof from shed, part of which carried over house onto powerline.
30. April 25	6:45 p.m.	Trego	NE	(1)	(1)	0	0	10,000	0	Probable tornado near Collyer caused damage on 2 farms.
31. April 26	4:20 p.m.	Lyon	(1)	1	20	0	0	600	0	1 3/4 miles north of Miller, roof lifted from house, 6 trees uprooted, and barn moved on 1 farm.
32. April 29	5:05 p.m.	Barber	(1)	(1)	(1)	0	0	(3)	0	Funnel reported at Kiowa.
33. April 29	5:05 p.m.	Harper	(1)	(1)						Funnel reported at Corwin.
34. April 29	5:05 p.m.	Harper	(1)	(1)						Funnel reported at Attica.
35. April 29	7:10-7:27 p.m.	Sedgwick	NNE	(1)	(1)	0	0	0	0	Funnel reported east of Valley Center, touching ground.
36. April 29	11 p.m.	Montgomery	NE	3/4	50	0	0	1,000	0	Probable tornado. Damage on 6 farms southwest of Liberty. No funnel observed,but loud roar heard.
37. May 1	6:05 p.m.	Reno	NE	1/4	30	0	0	1,000	0	4 miles west of Hutchison, 2 farm buildings destroyed.
38. May 1	6:30 p.m.	Montgomery	N and NNW	5	33	0	0	25,000	0	1 1/2 miles east of Independence, destroyed buildings on several farms. Funnel seen and roar heard.
39. May 1	6:30 p.m.	Labette	NE	5	(1)	0	0	(3)	0	5 miles southeast of Altamont. 3 funnels seen, 1 touching ground.
40. May 1	6:30 p.m.	Labette	NE							
41. May 1	6:30 p.m.	Labette	NE							
42. May 17	12:30-1:15 p.m.	Haskell	E	(1)	(1)	0	0	0	0	7 large funnels observed aloft in 30-mile radius of Sublette.
43. May 17	12:30-1:15 p.m.	Haskell	E	(1)	(1)	0	0	0	0	
44. May 17	12:30-1:15 p.m.	Haskell	E	(1)	(1)	0	0	0	0	
45. May 17	12:30-1:15 p.m.	Haskell	E	(1)	(1)	0	0	0	0	
46. May 17	12:30-1:15 p.m.	Haskell	E	(1)	(1)	0	0	0	0	
47. May 17	12:30-1:15 p.m.	Haskell	E	(1)	(1)	0	0	0	0	
48. May 17	12:30-1:15 p.m.	Haskell	E	(1)	(1)	0	0	0	0	
49. May 26	3:30 p.m.	Hamilton	SE	1/2	100	0	0	50,000	0	19 houses damaged in residental area of Syracuse.
50. May 28	3:15 a.m.	Comanche	(1)	(1)	(1)	0	0	0	0	Funnel observed hovering over Coldwater; did not reach ground.
51. May 31	2:50 p.m.	Anderson	NE	(1)	(1)	0	0	0	0	Observed by pilot 5 miles west of Welda, touching ground in open field.
52. May 31	3:30 p.m.	Neosho and Bourbon	NE	50	220	0	0	66,000	(3)	2 tornadoes. Buildings damaged 3 miles west of Thayer, 3 miles north-northeast of Thayer, 3 miles west of Stark, Hiattsville vicinity, and western edge of Fort Scott. Greatest damage near Hiattsville.
53. May 31	3:30 p.m.	Neosho and Bourbon	NE							
54. May 31	4:10 p.m.	Johnson	NNE	2	(4)	0	0	7,000	0	6 miles east of Olathe, barns and sheds on 4 farms damaged.
55. June 6	11:03 p. m.	Ford	NE	1/2	(1)	0	0	1,500	0	Probable tornado at Ford, north side of large cement-block building pulled out. Small buildings and trees damaged.
56. June 10	6 p.m.	Haskell	(1)	14	(1)	0	0	20,000	0	Probable tornado in vicinity of Sublette damaged roofs, plate-glass windows, and destroyed storage bins. Dust obscured clouds; no funnel seen.
57. June 10	6-8 p.m.	Kearny	NE	(1)	(1)	0	0	16,000	0	Tornado, identified by debris, demolished hanger and plane 12 miles north of Lakin.
58. June 10	8 p.m.	Finney	NE	7	15	0	0	25,000	0	In vicinity of Kalvesta, buildings on several farms damaged.
59. June 11	7 p.m.	Barton	(1)	(1)	(1)	0	0	0	0	Funnel sighted 10 miles east of Great Bend, but did not reach ground.
60. June 11	7:30 p.m.	Trego	(1)	(1)	(1)	0	0	2,000	0	3 buildings on 1 farm damaged 3/4 mile north of Voda.
61. June 11	8:05 p.m.	Kiowa	(1)	(1)	(1)	0	0	0	0	Report of funnel 5 miles north of Mullinville, not reaching ground.
62. June 11	Evening	Morris	(1)	(1)	(1)	0	0	(3)	0	Probable tornado 3 miles northeast of Dunlap, tore roof off basement house.
63. June 12	8:33 p.m.	Pawnee	(1)	(1)	(1)	0	0	0	0	Funnel cloud reported north of Larned, as reaching ground in open country.
64. June 14	1:30 p.m.	Barber	NE	2	440	0	0	300	0	3 miles southeast of Medicine Lodge, probable tornado damaged sheds on 1 farm.
65. June 14	2:45 p.m.	Russell and Lincoln	NE	(1)	880	0	0	4,000	0	Tornado damaged buildings on several farms from north of Dorrance into Lincoln County.

See reference notes at end of table.

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
KANSAS (Cont'd)										
66. June 14	7 p.m.	Harper	NE	4	(1)	0	0	$2,500	$ 0	2 points of damage. Several farmsteads hit and trees uprooted southeast of Harper. Barn and other buildings damaged 3 miles east of Anthony.
67. June 15	12:30 p.m.	Ellsworth	ENE	(1)	(1)	0	0	0	0	Several funnels reported northeast of Claflin to south of Kanopolis Dam, . 1 dipped in pasture. Another seen to south of Ellsworth.
68. June 15	12:30 p.m.	Ellsworth	(1)	(1)	(1)	0	0	0	0	
69. June 15	6:30 p.m.	Sedgwick	(1)	(1)	(1)	0	0	0	0	Funnel observed 6 miles southwest of Colwich.
70. June 21	4:05 p.m.	Cloud	E	4	(4)	0	0	3,000	6,000	3 miles east of Glasco, hay barn destroyed, roofs ripped off, windmills downed, trees toppled, and wheat and other grain shattered.
71. June 30	6:30 p.m.	Johnson	(1)	1	(1)	0	0	500	0	2 miles southwest of Olathe; damage to outbuildings on several farms indicated tornadic action.
72. July 1	3:08 p.m.	Saline	(1)	(1)	(1)	0	0	0	0	Funnel cloud observed to touch ground near Salemsburg, but did no damage before pulling back into clouds.
73. July 5	5 p.m.	Coffey	NE	(1)	(1)	0	0	5,500	500	2 funnels observed, 1 touching ground southeast of Aliceville. Building damaged and debris including deep-set posts carried high into air.
74. July 5	5 p.m.	Coffey	NE	(1)	(1)	0	0			
75. July 22	2:45 p.m.	Marion	NW	(1)	(1)	0	0	2,000	0	Debris of demolished machine shed scattered in 4 directions. Trees broken off. Occurred near Hillsboro.
76. July 22	Evening	Labette	NE	10	440	0	0	(3)	0	New machine shop unroofed, power-line poles pulled up, and small buildings lifted on 1 farm. Occurred 6 1/2 miles southwest of Oswego.
77. Aug. 5	4-5 p.m.	Marion	NE	17	(4)	0	0	(3)	0	Path of damage from Peabody northeastward indicative of tornado.
78. Aug. 5	5:15 p.m.	Reno	(1)	(1)	(1)	0	0	(3)	0	Suspected tornado near Hutchinson.
79. Aug. 5	Late afternoon	Kiowa and Rice	(1)	(1)	(1)	0	0	(3)	0	Suspected tornado hit Greensburg and Chase.
80. Aug. 5	6:30 p.m.	Franklin	NE	2	200	0	0	8,000	1,000	Damage to 2 farmsteads at Homewood.
81. Aug. 5	8:11 p.m.	Franklin	NE	1	300	0	2	15,000	0	Cement-block walls of large automobile shed collapsed outward, permitting roof to fall on cars and occupants at Ottawa.
82. Aug. 7	5:30 p.m.	Labette	(1)	5	400	0	0	(3)	0	Suspected tornado damaged several farmsteads northeast of Altamont.
83. Aug. 18	6:30 p.m.	Marion and Chase	E	9	50	0	0	3,000	0	Tornado first seen 3 1/2 miles southwest of Florence, then moved into Chase County. Damaged 1 farmstead, barn, and oil storage tank.
84. Aug. 20	(1)	Grant	NE	(1)	(1)	0	0	0	0	Funnel cloud reported 10 miles southwest of Ulysses.
85. Aug. 22	4 p.m.	Jewell	(1)	2	800	0	0	(3)	0	Numerous farm buildings unroofed and damaged at Jewell.
86. Aug. 23	2 p.m.	Jewell	NE	(1)	(1)	0	0	0	0	Funnel cloud, not reaching ground, observed at Ionia.
87. Aug. 23	5:45 p.m.	Saline	(1)	(1)	(1)	0	0	(5)	0	Shed destroyed 10 miles northwest of Salina.
88. Aug. 29	2 p.m.	McPherson	NE	(1)	(1)	0	0	0	0	2 funnel clouds observed, 1 dipped to ground in vicinity of McPherson.
89. Aug. 29	2 p.m.	McPherson	NE	(1)	(1)	0	0	0	0	
90. Sept. 9	2 a.m.	Sedgwick	(1)	(1)	(1)	0	0	(3)	0	Barn unroofed; trees and powerlines downed. Occurred 3 miles north of Maize.
91. Sept. 28	7:30 p.m.	Sedgwick	(1)	(1)	(1)	0	0	0	0	Funnel cloud observed 5 miles south of Wichita.
92. Oct. 4	6 p.m.	Sedgwick	SE	(1)	(1)	0	0	40,000	0	Modern school and 2-story building damaged at Wichita. Damage indicated tornadic action.
93. Oct. 11	3 a.m.	Ellis and Russell	E	(1)	(1)	0	0	10,000	0	Damage indicated tornadic action, but funnel not seen. Garage demolished, heavy equipment moved, and sucking effects noted 4 miles north of Catherine. 10 miles further east in Russell County buildings destroyed or unroofed, oil derricks blown down, and pick-up truck tossed 30 feet into air.
94. Oct. 26	12:05 a.m.	Sedgwick	SE	(2)	10	0	0	4,000	0	Occurred at Wichita. New home partially unroofed, with loosened timbers from structure splintered into shreds and scattered about. Nearby structures not disturbed.
KENTUCKY										
1. May 2	11-12 a.m.	Ohio	NE	6	25	0	0	5,000	0	Dipped to ground 4 miles east of Point Pleasant. Damage also near Centertown and Hartford. Bounding type. Uprooted trees, leveled shrubbery, ripped roofs and sidewalls of a few buildings, and demolished a barn.

See reference notes at end of table.

TORNADO DATA

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
KENTUCKY (Cont'd)										
2. June 1	9-10:15 a.m.	Laurel, Jackson, Clay, and Knox	NE	15	880	0	0	$90,000	$10,000	Bounding type. First struck at Mershons in Laurel County and moved into Jackson County. No definite tornado path in Clay and Knox Counties. Damage chiefly to residences and farm buildings.
3. Aug. 2	3-3:30 p.m.	Taylor and Washington	NE	1 1/2	100	0	0	10,000	3,000	Tornado first appeared near Finley in Taylor County, completely missed Marion County, and came to earth again in Washington County a short distance south of Springfield. Storm damaged or destroyed buildings, damaged some tobacco, and cut a path through a corn field.
LOUISIANA										
1. Feb. 19	9:25 p.m.	West Feliciana	NE	1/2	100	1	4	2,500	0	Hit Angola State Prison Farm; unroofed dormitory and damaged several guard towers and power lines.
2. April 8	3 p.m.	Jefferson Davis	NE	1	10	0	0	0	(5)	2 miles southeast of Iowa; moved across rice field.
3. April 9	4:10 p.m.	Jefferson Davis	NE	3	20	0	0	0	(5)	Plowed path through rice fieln between Welch and Jennings.
4. April 28	6 a.m.	Concordia	NE	1/2	50	0	0	5,000	0	Damaged several homes 4 miles west of Vidalia.
5. April 30	1:30 p.m.	Sabine	NE	15	100	1	6	25,000	(5)	Moved from Negreet to 8 miles south of Many; homes and buildings damaged.
6. April 30	2:30 p.m.	Winn	NE	(1)	(1)	0	0	5,000	1,000	10 miles northeast of Winnfield.
7. April 30	3:30 p.m.	Ouachita	NE	(1)	(1)	0	1	100,000	0	Destroyed waterworks and home at West Monroe.
8. May 31	10-10:30 p.m.	Orleans	(1)	(1)	(1)	0	0	0	0	Heavy waterspout over Lake Borgne; never reached land.
9. July 14	P.m.	Jefferson	(1)	(1)	(1)	0	0	0	0	Waterspout at Jefferson-Orleans Parish line on lake.
10. Aug. 16	4:45 p.m.	De Soto	N	4	100	0	0	10,000	0	Destroyed 2 buildings, blew down trees, and disrupted powerlines near Grand Cane.
11. Aug. 23	6 p.m.	West Carroll	NW	(1)	(1)	0	0	15,000	0	Struck near Oak Grove. Homes and barns destroyed or damaged. Evidence of lifting action when buildings raised up and shattered.
12. Aug. 29	2:30 p.m.	Natchitoches	NE	(1)	(1)	0	0	10,000	0	Moved across unpopulated area near city of Natchitoches. Several buildings damaged, power poles twisted off above ground, and trees damaged.
13. Aug. 29	3:15 p.m.	Iberville	NE	(1)	(1)	0	0	15,000	0	4 homes destroyed in Samstown. Evidence of lifting action.
MAINE										
1. July 7	2-2:05 p.m.	Washington	E	1/4	65	0	0	20,000	300	Struck Calais. Damaged trees, utility lines, and several buildings. Funnel cloud observed and debris thrown 200 feet in air.
2. Aug. 11	6:27-6:29 p.m.	Aroostook	ENE	1	15-35	1	1	9,000	1,000	Occurred 9 miles north of Caribou. Evidence of skipping along path. Several long strips of potatoes in ground literally dug up and scattered.
3. Nov. 2	1:15-1:50 p.m.	Cumberland and York	W	(1)	(1)	0	0	0	0	Off Cape Elizabeth, waterspout contacted water for only 5 minutes, but was seen dangling for another 30 minutes. Funnel finally swung inland near Biddeford Pool and disappeared into parent cloud.
MARYLAND										
*1. May 3	Afternoon	Frederick	(1)	(1)	(1)	0	0	(3)	(3)	Occurred at Brunswick; crossed from Lovettsville, Va. Damage to telephone and powerlines, roofs, and buildings.
2. July 14-15	11 p.m.-1 a.m.	Garrett	NE	20	880	0	(8)	(5)	0	Occurred at Oakland.
MASSACHUSETTS										
1. March 10	3 p.m.	Norfolk	(1)	6/ 65	3	0	0	(5)	0	Occurred at Foxboro. "Dust devil" with cloudless sky. Dark, swirling, cloudlike mass strewed debris for distance of 1/4 mile.
2. March 27	2 p.m.	Worcester	(1)	6/ 900	17	0	0	1,500	0	Occurred at Millbury. "Dust devil" lifted tarpaper roof from small shed and broke windows in greenhouse.
3. March 27	2:05 p.m.	Worcester	(1)	(1)	(1)	0	0	0	0	Occurred at Millville. "Dust devil" caused automobile to bounce up and down. Air filled with dust, trash, and tree branches.

See reference notes at end of table.

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						Killed	Injured	Property (exclusive of crops)	Crops	
MASSACHUSETTS (Cont'd)										
4. July 14	6:50-6:55 p.m.	Franklin	SSE	3	33	0	0	$2,000	$1,000	Spotty damage to trees and utility lines, with most damage in Griswoldville, small village in town of Colrain. A few twisted trees indicated incipient tornadic action.
5. Aug. 16	7:45-8:10 p.m.	Hampshire	SE	2	35	0	0	4,000	0	Occurred at Ware. Funnel observed by several persons. Tornado damaged trailer home and felled trees onto electric wires, disrupting service on some circuits.
MICHIGAN										
1. April 7	7 p.m.	Kalamazoo	E	(1)	33	0	0	8,500	0	Occurred at Fulton; 2 barns flattened, roof torn off apartment house, several other buildings damaged. Hail 1 inch in diameter.
2. April 8	10 a.m.	Calhoun	(1)	(1)	(1)	0	0	0	0	Tornado cloud aloft sighted by pilot 10 miles northwest of Battle Creek.
3. April 8	7:15 p.m.	Genessee	(1)	(1)	(1)	0	2	25,000	0	7 pendants observed from same cloud, 1 dipping to ground destroyed 2 barns; damaged 2 fire engines and 2 autos; carried garage roof 100 yards, and blew in store windows at Swartz Creek.
4. May 31	5 p.m.	Van Buren	NE	10	(1)	0	0	T✓ 500,000	C	From 5 miles west of Bangor to near Grand Junction. 40 barns and other buildings destroyed or damaged, trees uprooted or snapped off, and power and telephone lines broken.
5. May 31	5:10 p.m.	Allegan	(1)	1/4	110	[illegible]	0	3,500	100	5 miles east of Allegan, roof of barn lifted over house and deposited on tree which was crushed. 5 big elms blown down and parts of barn found 1/4 mile away.
6. May 31	6:45 p.m.	Branch	NE	1/4	130	0	0	41,000	0	Numerous cottages damaged on Coldwater Lake.
7. May 31	7:45 p.m.	Washtenaw	(1)	(1)	(1)	0	0	200	600	Near Scio, tool shed roof and doors ripped off, 10 trees flattened, 1 of which fell on house porch.
8. May 31	8:30 p.m.	Wayne	NE	1 3/4	100	0	0	3,000	0	Small tornado moved in an arc to right, about 2 miles east of Detroit City Airport.
9. June 12	5:30 p.m.	Lenawee	E	(1)	(1)	0	0	(3)	0	3 miles west of Cambridge Junction, barn demolished.
10. June 19	Late afternoon	Jackson	(1)	(1)	(1)	0	0	(3)	0	Swept across Gillett's Lake, damaging several houses and cars.
11. Aug. 2	Noon	Leelanau	SE	(1)	(1)	0	0	0	0	2 waterspouts, 8 minutes apart, developed off Northport Point and moved slowly across Grand Traverse Bay and disappeared before reaching land.
12. Aug. 2	12:08 p.m.	Leelanau	SE	(1)	(1)	0	0	0	0	
13. Aug. 9	3:45 p.m.	Alcona	N then NE	1/4	500	0	0	10,000	0	Struck northeast end of Cedar Lake, damaging several cottages. Path was arc-shaped.
14. Aug. 24	4 p.m.	Genesee	E	1 1/3	10	0	0	(5)	0	Cloud looked like column of smoke; shattered garage and broke windows. Debris found 500 feet away. Occurred in vicinity of Flint.
15. Aug. 24	Afternoon	Sanilac	E	(1)	(1)	0	0	0	0	At Birch Beach, 5 miles south of Lexington, waterspout observed 2 miles out in Lake Huron.
16. Oct. 14	4:50 p.m.	Gratiot	(1)	2	50	0	0	T✓ 15,000	C	Occurred at Ashley; destroyed country school and numerous other buildings damaged. Cut path of damage through corn field.
17. Oct. 14	6:10 p.m.	Genesee	(1)	(1)	(1)	0	0	0	0	2 fingers of black cloud seen to dip into northern Flint.
MINNESOTA										
1. May 30	5:45-9 p.m.	Todd and Stearns	SE	80	(4)	0	0	T✓ 35,000	C	2 barns demolished and another barn moved from the foundation in the vicinity of Long Prairie. A large building unroofed and a huge smokestack toppled in St. Cloud in a windstorm that appeared to be weak tornado development. Path not continuous.
2. June 14	3:45 p.m.	Stearns	NNW	4	(4)	0	0	T✓ 55,000	C	Near Elrosa. All major damage apparently on 3 farms located on 1 road. Funnel reported observed. Winds rotary, and uprooted trees lying in all directions.
3. June 17	8:15 p.m.	Chisago	NE	4	880	0	0	T✓ 100,000	C	12 barns and a rural school demolished. On farm where barn and all outbuildings wrecked, several 2 x 4 boards driven through wall of house. In vicinity of Rush City.

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MINNESOTA (Cont'd)										
4. June 25	4:15 a.m.	Washington	E	3	(1)	0	0	T✓ $ 25,000	$ C	In Denmark Township. Home and barn demolished; barns on 2 other farms unroofed. Heavy steel clothes pole completely bent over. Building alongside wrecked garage not damaged.
5. June 29	4:20 p.m.	Goodhue and Olmsted	(1)	(1)	(1)	0	0	0	0	Twin funnels aloft sighted northwest of Pine Island and single funnel aloft observed by airplane pilot about 5 miles west of Rochester. None descended to earth.
6. June 29	4:20 p.m.	Goodhue and Olmsted	(1)	(1)	(1)	0	0	0	0	
7. June 29	4:20 p.m.	Goodhue and Olmsted	(1)	(1)	(1)	0	0	0	0	
8. July 6	7 a.m.	Morrison	SSE	(2)	440	0	0	T✓ 4,000	C	Large barn badly damaged, but house nearby untouched except a missing window pane. Farmer lifted about 40 feet in air and dropped to ground unhurt. Silo demolished. Occurred near Harding.
9. Aug. 15	3:15 p.m.	Swift	SE	8	(4)	0	0	25,000	0	In vicinity of Swift Falls. All buildings on a farm, except the house, demolished. Small buildings on a number of farms wrecked. A funnel reported observed.
10. Aug. 15	4:30 p.m.	Benton	E	1	10	0	1	T✓ 25,000	C	Extensive damage to lake cottages and farm buildings at Little Rock Lake. Pump pulled out of well casing and debris found strewn around in usual counterclockwise fashion.
11. Aug. 24	11:15-11:45 p.m.	Pipestone	E	(1)	(1)	0	0	0	0	2 tornado-like clouds sighted about 10 miles north of Pipestone. Apparently, funnels did not descent to earth as no damage reported.
12. Aug. 24	11:15-11:45 p.m.	Pipestone	E	(1)	(1)	0	0	0	0	
MISSISSIPPI										
1. Jan. 20	5:30 a.m.	Oktibbeha and Lowndes	NE	15	25	0	2	10,000	1,000	Developed near Oktoc, Oktibbeha County, moved about 10 to 15 m.p.h. into northwestern Lowndes County. Destroyed 2 homes and a barn, and damaged others; damaged powerlines and some timber.
2. Jan. 20	5:30-6 a.m.	Lowndes	NE	4	100	0	0	2,000	500	5 to 7 miles south of Columbus in thinly populated area. Destroyed and damaged some outbuildings.
3. Feb. 20	12:35 a.m.	Lamar, Covington, and Jones	NE	50	200	0	10	300,000	2,500	Moved from 10 miles southwest of Sumrall, Lamar County, through eastern part of Sumrall causing $250,000 damage, then struck 6 miles west of Laurel, Jones County, and degenerated into squalls in Jasper County. Destroyed 20 and damaged 25 homes, destroyed 3 and damaged 10 other buildings in Lamar County. Damaged 50 homes, 60 barns, much timber, and agricultural supplies in storage in Jones County.
4. Feb. 20	1:30-2:15 a.m.	Newton and Neshoba	NE	25	100	0	10	100,000	1,000	Moved from Decatur to House community, about 12 miles south-southeast of Philadelphia; 23 homes destroyed and 42 damaged.
5. April 28	7 p.m.	Itawamba	NE	(1)	(1)	0	2	8,000	(5)	7 miles northeast of Fulton.
*6. April 28	7 p.m.	Alcorn	NE	(1)	(1)	0	0	3,000	0	2 funnels observed. 1 tornado moved into Tennessee.
7. April 28	7 p.m.	Alcorn	NE	(1)	(1)	0	0			
8. April 30	Late evening	Scott	(1)	6	(1)	0	0	0	0	Moved through uninhabited timber area at Pulaski.
9. May 27	2:30 p.m.	Madison	(1)	(1)	(1)	0	0	500	0	Demolished tool shed and porch of house at Ridgeland.
10. June 3	6 a.m.	Newton	NE	7	300	0	3	8,000	2,000	Moved from Berry, 10 miles north of Newton, to Blue Spring's Church. 1 home destroyed, 4 damaged, and 3 barns destroyed.
11. July 9	9 a.m.	Newton	(1)	(1)	(1)	0	0	15,000	0	Occurred at Newton.
12. July 18	6:02 p.m.	Marshall	NE	(1)	(1)	0	0	0	0	Tornado funnel aloft near Holly Springs.
13. July 24	6 p.m.	Sunflower	SE	(1)	(1)	0	0	15,000	(5)	Damaged 2 schools, 3 homes, and 2 barns at Rome.
14. Dec. 28	6 p.m.	Jones	NE	10	250	0	25	750,000	(5)	Swept across 20 blocks of Laurel, destroying 20 and damaging 87 homes, destroying 2 and damaging 6 other buildings; trees uprooted and utility lines downed.
15. Dec. 28	6 p.m.	Smith	NE	(1)	(1)	0	0	10,000	0	1 home destroyed and 5 damaged.
16. Dec. 29	1 a.m.	Kemper and Noxubee	NE	10	300	0	10	50,000	(5)	Destroyed 11 buildings and damaged 25 near Gholson.
MISSOURI										
1. March 24	10 p.m.	Barton	NE	(1)	(1)	0	0	T✓ 100,000	C	In Lamar, barns and frame houses demolished or severely damaged. Several cattle killed or injured.

See reference notes at end of table.

TORNADO DATA

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MISSOURI (Cont'd)										
2. March 24	10 p.m.	Jasper	(1)	(1)	(1)	0	0	$2,000	$ 0	Garage and farm equipment damaged in Burgess.
3. March 24	11 p.m.	Barry	(1)	(1)	(1)	0	2	✓T 25,000	C	Damage to small buildings and equipment at Purdy, McDowell, Washburn, Flat Creek, and Cato.
4. March 24	11 p.m.	Texas	(1)	(1)	(1)	0	0	✓T 25,000	C	Broiler house damaged, outbuildings and barns leveled, and 3,000 pullets killed or injured at Success.
5. March 24	11 p.m.	Newton	(1)	(1)	(1)	0	0	(3)	0	Occurred at Fairview.
6. March 24	11 p.m.	Newton and McDonald	NE	(1)	(1)	0	1	(3)	0	Small frame farmhouses and barns leveled, cattle and poultry killed near Lanagan, Rocky Comfort, and Oshkosh.
7. March 24	11 p.m.	Webster	(1)	(1)	(1)	0	0	✓T 20,000	C	Trees uprooted, warehouse demolished, 20 cows killed at Fordland and 8 miles north of Seymour.
8. March 24	11-12 p.m.	Christian	(1)	5	900	0	0	✓T 20,000	C	Ozark and Elk Valley suffered damage to small buildings.
9. March 25	1-2 a.m.	Franklin	(1)	20	(1)	0	0	5,000	0	Brick house damaged at Gray Summit. Power and telephone services disrupted.
10. March 25	1 a.m.	Texas	(1)	15	100	2	0	✓T 35,000	C	Couple killed when frame house demolished; bodies found 150 yards away. Smaller buildings damaged beyond repair at Bendavis (near Houston).
11. March 25	2 a.m.	St. Louis and Franklin	ENE	3	30	0	0	20,000	0	Barns, roofs, and equipment damaged south of Pacific.
12. March 25	2 a.m.	St. Charles	ENE	1	60	0	0	5,000	0	Outbuildings tipped from foundations; porch roof torn off west of West Alton.
13. March 25	2 a.m.	St. Charles	(1)	20	(1)	0	0	35,000	0	House leveled at Gilmore. 2 small bolted-down buildings lifted off foundations. 3 aircraft damaged at Smartt Field.
14. March 25	2 a.m.	St. Louis and Franklin	ENE	10	20	0	0	20,000	0	Noise of tornado heard. Brick house, concrete-block garage, and several barns demolished in zone from St. Albans to Chesterfield to Maryland Heights.
15. April 5	1:30-2 a.m.	Audrain	(1)	(1)	(1)	0	0	5,000	1,000	House destroyed and small fruit trees and crops damaged near Mexico and Benton City.
*16. April 5	5-5:10 p.m.	Atchison	NE	2	500-900	0	2	131,500	18,500	4 homes destroyed, 4 damaged, 65 outbuildings hit. Up to 2 inches of topsoil removed. 2 funnels seen in close proximity 2 1/2 miles north of Westboro. Both tornadoes crossed into Iowa.
* 17. April 5	5-5:10p.m.	Atchison	NE							
18. April 15	3:30 p.m.	Dunklin	NE	1	(1)	0	0	✓T 20,000	C	2 farmhouses damaged, 1 destroyed. Numerous outbuildings damaged or destroyed at Senath.
19. April 30	1 p.m.	Barry	(1)	6	(1)	0	0	(3)	0	Trees torn apart, outbuildings and equipment damaged between Cassville and Roaring River.
20. April 30	2-3 p.m.	Morgan	(1)	3	400	0	1	45,000	5,000	1 house leveled and several outbuildings destroyed at Versailles. Woman injured by flying debris.
*21. April 30	3:15 p.m.	Boone, Audrain, Monroe, Shelby, Knox, Lewis, and Clark	NNE	(1)	(1)	0	0	(3)	(3)	Moved from Strugeon, Boone County, to near Kahoka, Clark County, then into Iowa. 1 barn and several outbuildings demolished.
22. May 2	2 a.m.	New Madrid	(1)	(2)	(4)	0	0	21,000	0	3 houses and 2 barns hit 5 miles northeast of Gideon. Funnel seen aloft over Sikeston at 2:30 a.m.
23. May 28	1:15 p.m.	Morgan and Camden	(1)	(1)	(1)	0	0	150,000	0	51 homes, 16 docks, and several boats destroyed or severely damaged, in resort area of Forthview on Lake of the Ozarks.
24. May 31	2:45-3:15 p.m.	Atchison and Nodaway	NE	20	440	0	0	20,000	0	8 farms had buildings damaged, 1 bull killed. Tornado traveled from 4 miles south of Tarkio to just northwest of Burlington Junction.
25. May 31	4:20 p.m.	Vernon	(1)	(2)	(4)	0	0	20,000	0	10 farmsteads hit near and northeast of crossing of Drywood Creek by Highway 54. Barns destroyed and homes damaged.
26. June 2	5:30-6p.m.	Livingston	E	10	150	0	0	(5)	0	Funnel observed. Damage to small buildings and wheat from south of Chillicothe to 5 miles north of Wheeling.
27. June 14	9 p.m.	Macon	(1)	(2)	(4)	0	0	(5)	0	At La Plata, funnel crossed Santa Fe picnic grounds and moved bathhouse.
28. June 15	1 p.m.	Holt	(1)	(2)	(4)	0	0	(5)	0	Unroofed pumphouse at Napier.
29. Aug. 18	Late afternoon	Franklin	NNE	(2)	(4)	0	0	7,500	0	5 farmsteads hit from Kiel to Detmold.
30. Sept. 4	2 p.m.	Vernon	SW	1	200	0	0	1,000	0	Church, 5 miles south of Hume, moved 18 inches from its foundation.
31. Sept. 6	12:30 p.m.	Dunklin	(1)	1/2	(1)	0	0	2,000	0	Barn and tool sheds blown down 2 miles northeast of Campbell.

See reference notes at end of table.

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						Killed	Injured	Property (exclusive of crops)	Crops	
MONTANA										
1. May 27	4 p.m.	Powder River	S	1/4	20	0	0	$5,000	$ 0	Occurred at Broadus. Unroofed building, carrying roof 50 feet into street with portion of roof driven through windshield of car.
2. July 9	10 p.m.	Valley	NE	2	75	0	0	(3)	(3)	20 miles southeast of Opheim, caused spotty damage to fences, power poles, crops, and buildings near path.
3. July 26	4 p.m.	Fallon	NE	3	18	0	0	600	0	Occurred at Knobs. Some damage to windmill and fences.
4. Aug. 26	4:30 p.m.	McCone	NE	15	(1)	0	0	150,000	20,000	In vicinity of Vida.
NEBRASKA										
1. March 18	Afternoon	Otoe	(1)	(1)	(1)	0	0	0	0	Funnel cloud aloft observed at Talmage.
2. April 5	4 p.m.	Otoe	(1)	(1)	(1)	0	0	0	0	Funnel cloud aloft observed near Paul.
3. April 20	8:30-9:10 p.m.	Frontier	E	6	(4)	0	0	15,000	0	6 miles south of Eustis, damaged several sets of farm buildings and destroyed 1 set.
4. May 15	Afternoon	Hall	(1)	(1)	(1)	0	0	0	0	Funnel cloud aloft observed near Cairo.
5. May 15	Afternoon	Scotts Bluff and Morrill	(1)	(1)	(1)	0	0	0	0	Funnel cloud observed, but passed over open country near Scotts Bluff and Morrill County line.
6. May 22	Evening	Dawes	(1)	(2)	(4)	0	0	(5)	0	Near Dunlap, a few small outbuildings upset.
7. May 30	8-9:45 p.m.	Platte, Madison, and Wayne	NE	33	400	6	16	450,000	(5)	First struck southeast of Newman Grove, moved toward Norfolk. Struck 3 farms southeast of Norfolk where all deaths and most injuries occurred and farm buildings destroyed. Church and school also destroyed.
8. June 6	4-5 p.m.	Kimball and Cheyenne	N	(1)	(4)	0	0	20,000	(5)	
9. June 6	5:30-6 p.m.	Grant	(1)	4 1/2	(4)	0	0	60,000	0	Elaborate set of ranch buildings destroyed near Hyannis.
10. June 9	10:30 p.m.	Stanton	(1)	(1)	(1)	0	0	0	0	Funnel cloud aloft observed at Pilger.
11. June 11	12:30 a.m.	Johnson	(1)	(1)	(1)	0	0	1,000	0	Damage only in 1 spot.
12. June 13	A.m.	Platte	(1)	(1)	(1)	0	0	0	0	Funnel cloud aloft observed at Platte Center.
13. June 13	3:30-3:45 p.m.	Hitchcock	(1)	(2)	(1)	0	0	8,000	0	Grandstand roof destroyed near Trenton.
14. June 16	6:15-7 p.m.	Dawson	(1)	3	(4)	0	0	500	0	Garage destroyed 8 miles south-southwest of Cozad.
15. June 17	7-8:30 p.m.	Stanton, Wayne, and Thurston	NE	16	(4)	1	1	75,000	0	North of Pilger to west of Pender, 10 sets of farm buildings, 1 church, and 1 school destroyed or badly damaged.
16. June 20	Late afternoon	Burt	(1)	(1)	(1)	0	0	0	0	Funnel cloud aloft observed north of Tekamah.
17. June 20	Evening	Madison	(1)	1	(4)	0	0	15,000	0	Occurred near Tilden.
18. June 20	11 p.m.	Hall	NE	1	(4)	0	0	2,500	0	Upper part of higher buildings damaged at Grand Island. No damage near surface.
19. July 20	5 p.m.	Johnson	NE	1	35	0	0	3,000	(5)	5 miles southwest of Tecumseh. Cattle shed destroyed and telephone lines damaged.
20. July 27	2:45 p.m.	Sherman	SW	(2)	(4)	0	0	2,500	(5)	4 miles west of Loup City, barn damaged.
21. July 30	4 p.m.	York	ENE	2	850	0	0	15,000	(5)	West of York, 5 sets of farm buildings destroyed or damaged.
22. Aug. 13	7 p.m.	Dawson	(1)	(1)	(1)	0	0	2,000	0	Southeast of Lexington, barn destroyed and 2 calves lost.
23. Aug. 25	4 a.m.	Thurston	NE	(1)	(1)	0	0	700	(5)	2 miles east of Thurston, farm buildings damaged.
NEVADA										
(None reported)										
NEW HAMPSHIRE										
1. July 31	4:15 p.m.	Rockingham	SE	4	70	0	0	25,000	0	Occurred at Derry and Hampstead. Bulk of damage to trees and cottages along shore and on 2 islands in Island Pond.
NEW JERSEY										
(None reported)										
NEW MEXICO										
1. May 16	2 p.m.	Lea	ENE	1/2	100	0	0	500	0	12 miles west of Lovington over open country, some telephone poles down.
2. May 16	4:30 p.m.	Lea	NNE	(1)	(1)	0	0	0	0	Over open range, no damage; 5 miles north of Jal.
3. May 17	3 p.m.	Socorro	(1)	(1)	(1)	0	0	0	0	Over open range, no damage; 25 miles southeast of Socorro.
4. May 17	7 p.m.	Lea	(1)	(1)	(1)	0	0	0	0	In open country, principal damage from hail and flooding; occurred at Lovington.

See reference notes at end of table.

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
NEW MEXICO (Cont'd)										
5. May 17	8 p.m.	Lea	ENE	6	50	0	0	$ 0	$ 0	In open country, no damage; 5 miles northwest of Jal.
6. June 29	1:30 p.m.	Union	NE	4	300	0	0	0	0	4 miles south of Stead in open country; no damage.
7. July 31	5:30 p.m.	Valencia	SE	4	300	0	0	500	0	Mostly over open fields and orchards; some damage to outhuildings 6 miles south of Belen.
8. Aug. 24	8 p.m.	Roosevelt	(1)	(1)	(1)	0	0	0	0	Mostly over open country; minor damage to fences and outbuildings 7 miles northwest of Elida.
NEW YORK										
1. Sept. 19	5:30 p.m.	St. Lawrence	NE	3	(1)	0	0	20,000	0	Buildings damaged and demolished, trees uprooted, automobiles damaged, and utility lines broken in Fort Jackson-Buckton-Hopkinton area.
NORTH CAROLINA										
1. Feb. 21	5 a.m.	Montgomery	NE	20	25	0	0	10,000	0	Moved on skipping path from south of Mount Gilead to Candor. Damaged roofs and transmission lines; moved 1 house on foundation.
2. June 16	1:30 p.m.	Guilford	(1)	5	100	0	1	5,000	0	Cement-block structure in Bakerstown destroyed, woman inside hurt. Many roofs damaged slightly.
3. June 23	5:15 p.m.	New Hanover	(1)	2	25	0	0	60,000	0	Hit Wrightsville Beach area in skipping path. Damaged several houses, mainly in 3-block area on north end of beach.
4. June 27	3:12 p.m.	Beaufort	(1)	1	50	0	0	30,000	0	Warehouses and other buildings damaged in Washington.
5. Aug. 17	3:30 p.m.	Randolph	(1)	1	50	0	0	150,000	0	Hosiery mill at Staley destroyed and several homes damaged.
6. Aug. 18	3 p.m.	Catawba	(1)	1	25	0	0	50,000	0	1 building moved 400 feet, others damaged. Occurred in Newton and Claremont areas.
7. Sept. 20	3:43 p.m.	Wilson	ENE	5	100	0	5	100,000	10,000	School demolished and other buildings damaged in city of Wilson.
8. Nov. 2	2:30 p.m.	Pender	NE	6 100	25	0	0	20,000	0	Store building and 2 homes destroyed on New Topsail Beach.
9. Nov. 28	9:30 p.m.	Cabarrus	(1)	2	500	0	0	20,000	0	Farm home and outbuildings demolished. Trees blown down and twisted off.
NORTH DAKOTA										
1. June 7	10 a.m.	Cass	(1)	(1)	(1)	0	0	0	0	Funnel cloud south of Fargo, did not reach ground.
2. June 7	Afternoon	Stutsman	NE	(1)	(1)	0	0	0	0	Very brief. Seen at edge of Jamestown Airport.
3. June 14	1:58 p.m.	Barnes	NE	4	(4)	0	0	0	0	Very thin point touching ground southwest of Lucca.
4. June 16	1 p.m.	Grant	NE	(1)	(1)	0	0	0	0	Funnel cloud 20 miles south of Elgin.
5. July 6	Evening	Wells	NE	2-3	880	0	0	10,000	0	Destroyed barn, damaged other small buildings. Affected 2 farms only. Occurred 5 1/2 miles southeast of Harvey.
6. Aug. 6	8 p.m.	Billings	(1)	(1)	(1)	0	0	0	0	Tornado near Medora reported by pilot.
OHIO										
1. March 19	8:50 p.m.	Ross	NE	1	100	0	0	47,000	3,000	Occurred between Adelphi and Laurelville; lifted roofs, leveled garages and barns, and killed 4,000 chickens.
2. April 27	6:55 p.m.	Jefferson	NE	1	50	0	1	75,000	0	Wrecked garage, badly damaged 3 other buildings, and caused minor damage to a dozen houses in Adena. Other damage to parked cars, windows, trees, etc.
3. May 2	3:30 p.m.	Hamilton	NE	1	10-40	0	1	250,000	0	Struck in northern and eastern parts of Cincinnati. Roofs torn away, large trees broken off, and powerlines torn down. Numerous cars and houses damaged by falling trees.
4. May 2	6 p.m.	Fulton	NE	(1)	(1)	0	0	0	0	2 small tornadoes 10 miles apart about 30 miles west of Lyons.
5. May 2	6 p.m.	Fulton	NE	(1)	(1)	0	0	0	0	
6. May 2	6 p.m.	Henry	NE	(1)	(1)	0	0	0	0	Funnel cloud observed 3 miles south of Hamler.
7. May 2	6 p.m.	Putnam	NE	(1)	(1)	0	0	0	0	Funnel cloud observed northwest of Columbus Grove.
8. June 26	Late a.m.-early p.m.	Muskingum	E	(1)	(1)	0	3	27,000	0	Occurred at Zanesville; unroofed barn and house.
9. June 26	Late a.m.-early p.m.	Franklin	(1)	(1)	(1)	0	0	(5)	0	Small tornado 9 miles northeast of Columbus Airport.

See reference notes at end of table.

TORNADO DATA

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons: Killed	Number of persons: Injured	Estimated damage: Property (exclusive of crops)	Estimated damage: Crops	Remarks
OHIO (Cont'd)										
10. Aug. 12	Evening	Erie	SE	1/4	25	0	0	$ 500	$ 0	Minor tornado activity in vicinity of Vermilion. Only damage reported was to trap net racks from which nets were picked up and damaged.
11. Aug. 30	4:45 p.m.	Erie	SSE	1/10	50	0	0	5,000	0	Storm moved off lake, striking farm building near Huron. Parts of farm building destroyed and 200 chickens killed.
12. Sept. 30	9-10 p.m.	Stark	E	4-6	50	1	3	15,000	0	Occurred at Minerva in connection with line of severe thunderstorm.
13. Oct. 11	6:30 p.m.	Franklin	E	1/4	300	0	0	1,000	0	Minor tornado struck near Columbus in open country, damaging trees and roofs on 2 farms. Shocked corn strewn about.
OKLAHOMA										
1. March 24	3:15 p.m.	Alfalfa	N	(1)	880	0	0	(5)	(5)	Occurred in Goltry area.
2. March 24	3:30 p.m.	Caddo	NNE	3	75	0	0	25,100	4,900	In vicinity of Alfalfa several farmsteads damaged and horse lifted into air.
3. March 24	6:30 p.m.	Oklahoma	(1)	(1)	(1)	0	0	0	0	Funnel cloud aloft observed over Tinker Field.
4. March 24	6:30 p.m.	Lincoln	(1)	(1)	(1)	0	0	0	0	Funnel cloud aloft observed over Wellston.
5. March 24	7:05 p.m.	Kay	NE	3	200	0	0	9,700	300	Occurred in vicinity of Newkirk.
6. March 24	9:15-9:30 p.m.	Creek	NNE	3	200	0	0	2,500	(5)	Damaged garages and other buildings at Sapulpa Creek.
7. March 24	9:25-9:30 p.m.	Muskogee	N	1	(4)	0	0	70,000	(5)	Damaged several residences in Haskell.
8. March 24	10 p.m.	Delaware	NNE	20	(4)	0	0	7,000	(5)	Moved from southeast of Rose to near Jay. 3 farmsteads damaged.
9. March 24	10:18 p.m.	Mayes, Craig, and Delaware	NE	6	50	0	0	20,000	(5)	Path from west of Pensacola to shoreline of Grand Lake.
10. April 26	3:30 p.m.	Custer	(1)	(1)	(1)	0	0	(5)	0	Damage on farm 4 miles south of Clinton.
11. April 26	3:30 p.m.	Washita	(1)	(1)	(1)	0	0	0	0	Funnel cloud, not touching ground, observed at Dill City.
12. April 26	5:30 p.m.	Kiowa	ENE	(1)	(1)	0	0	0	0	Funnel cloud, not touching ground, observed in Gotebo area.
13. April 26	6-6:05 p.m.	Caddo	ENE	1	50	0	0	0	0	Small tornado dipped into open field near Carnegie.
14. April 27	2 a.m.	Garvin	(1)	(2)	(4)	0	0	6,000	0	3 houses damaged at Antioch. Funnel touched ground twice.
15. April 27	6:30 p.m.	Greer	(1)	(2)	(4)	0	0	1,000	(5)	Damaged brooder house and poultry in Lake Creek community.
16. April 29	1:13 a.m.	Tulsa	NE	(1)	(1)	0	0	0	0	Funnel cloud observed west of Broken Arrow.
17. April 29	3:30 p.m.	Alfalfa	NE	3/4	100	0	0	1,000	0	1 farmstead damaged near Orion community.
18. April 29	Afternoon	Roger Mills, Ellis, and Dewey	NE	33	(4)	0	0	25,000	0	First observed in northern Roger Mills County, moved into Ellis County. Dipped 3 times, tearing up black-top paving on highway and damaged 3 farmsteads. Then moved to near Vici, Dewey County, where damage occurred on 5 farms.
19. April 29	5:30-6:30 p.m.	Dewey	NE	4	1,000	0	0	900	0	4 tornado funnels observed from west of Camargo to Cestos, causing damage to a few buildings.
20. April 29	5:30-6:30 p.m.	Dewey	NE							
21. April 29	5:30-6:30 p.m.	Dewey	NE							
22. April 29	5:30-6:30 p.m.	Dewey	NE							
23. April 29	6:45 p.m.	Kingfisher	N	4	100	0	2	31,000	0	4 farmsteads damaged southeast of Loyal. Storm moved slowly, taking about 15 minutes to cover 4-mile long path.
24. April 29	9:45 p.m.	Comanche and Stephens	ENE	20	10	0	0	(5)	0	Moved from Lawton to Marlow.
25. April 29	Night	Canadian	NE	2	(4)	0	0	(3)	0	Southwest of Yukon, damage to 4 farmsteads.
26. April 30	1 a.m.	Pontotoc	N	(2)	(4)	0	0	1,000	0	4 miles west of Konawa, damage to buildings on 3 farms.
27. April 30	9:30-9:45 a.m.	Choctaw	NE	1	150	0	12	150,000	0	Damage in at least 20 square blocks in Hugo.
28. April 30	10:45 a.m.	Haskell	NE	(2)	(4)	0	0	2,000	0	Near Stigler, school house damaged.
*29. May 1	2:10-4:30 p.m.	Tillman and Kiowa	NE	20	440	0	3	405,000	0	Originated in Texas, entered southwestern Tillman County, moved to east of Tipton into Kiowa County near Snyder. Damage to 20 homes and barns, 1 school, and 1 cotton gin. Damage in Kiowa County $5,000, in Tillman County $400,000.
30. May 1	3:30 p.m.	Tillman	NE	(2)	(4)	0	0	10,000	0	West of Davidson, 3 farmsteads damaged.
31. May 1	4 p.m.	Tillman and Cotton	NE	12	(4)	2	4	500,000	0	From near Grandfield to Ahpeatone area; about 10 places damaged. Deaths and injuries in Cotton County.
32. May 1	4:50-4:55 p.m.	Caddo	NE	10	300	0	0	10,000	0	From Broxton to Washita. 3 houses damaged and more than a dozen barns and other buildings destroyed.

See reference notes at end of table.

TORNADO DATA

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
OKLAHOMA (Cont'd)										
33. May 1	5:45 p.m.	Stephens	N	6	100	0	0	$ 10,000	$ 0	Occurred at Marlow.
34. May 1	5:42-5:48 p.m.	Payne, Pawnee, and Osage	NE	8	(4)	0	7	50,000	0	Moved from Glencoe to Pawnee to Cleveland; 15 farm homes destroyed, 11 others damaged, and other buildings destroyed or damaged.
35. May 1	5:45-6:30 p.m.	Cotton, Jefferson, and Stephens	ENE	45	300	0	0	150,000	0	Tornado funnel described as "barrel-shaped" originated in southern Cotton County, moved to south of Hastings to near Addington, and into Stephens County.
36. May 1	6 p.m.	Coal	NE	[6] 100	33	0	0	2,000	0	1 mile east of Colgate tornado damaged 1 house.
37. May 1	6-7:30 p.m.	Pottawatomie, Lincoln, and Creek	NE	40	(1)	0	65	800,000	20,000	From northeast of Dale, through Meeker, Sparks, and Davenport, to near Depew. Damage in Pottawatomie County $500,000, in Creek County $15,000 to 12 farms. In Lincoln County, mostly near Meeker, 32 houses destroyed, 31 damaged, 53 outbuildings destroyed and 4 damaged. Large bus thrown 300 feet, overturned east of Meeker.
38. May 1	6-8:10 p.m.	Pontotoc, Seminole, Hughes, and Okfuskee	NNE	50	(4)	0	6	45,000	0	Moved from Cedar Grove community, through Sasakwa and Hughes, into Okfuskee County. Damage occurred in Cedar Grove, Spaulding, Holdenville, Yeager, Wetumka, and Weleetka.
39. May 1	6:15 p.m.	Seminole	NE	[6] 200	100	0	0	20,000	0	Occurred in Bowlegs and Excelsior communities. Damage to 20 houses in Excelsior area.
40. May 1	7:05-7:10 p.m.	Seminole and Okfuskee	NNE	5	220	0	0	50,000	0	1 1/2 miles northwest of Cromwell to rural area in western Okfuskee County. 2 funnels joined; when they came together their lateral movement stopped for 4 or 5 minutes during which time funnel rose into cloud and dipped back to earth 10 to 15 times.
41. May 1	7:20-8:20 p.m.	Pittsburg and McIntosh	N	30	400	0	6	34,000	0	Observed southwest of McAlester, damage $30,000; later west of McAlester, some trees damaged. Near Canadian, 9 homes damaged ($4,000), 6 persons injured. Damage minor in southern McIntosh County.
42. May 2	7:40 p.m.	McCurtain	NE	2	50	0	0	1,500	0	Small area 4 miles south of Hayworth affected.
43. May 23	9 p.m.	Greer	NNE	25	(1)	0	0	1,500	0	Struck 2 farmsteads south of Mangum.
44. May 24	Late a.m.	Cotton	NE	(1)	(1)	0	0	0	0	Tornado funnel aloft observed near Walters.
45. May 24	4:55 p.m.	Johnston	NE	(2)	(4)	0	0	(3)	0	Considerable damage to trees and residences at Bromide.
46. May 25	5:30-5:45 p.m.	Muskogee	NE	(2)	(4)	0	0	(5)	0	Houses and other small structures unroofed at Porum.
47. May 25	Late afternoon	Custer	NE	(1)	(1)	0	0	0	0	Tornado funnel observed to touch ground at Thomas.
48. May 28	4:55-4:56 p.m.	McIntosh	NE	[6] 200	100	0	0	(5)	0	1 barn unroofed and trees uprooted 3/4 mile northwest of Checotah.
49. June 2	1:45 a.m.	Pittsburg	NE	(1)	(1)	0	0	0	0	Tornado aloft observed southwest then east of McAlester.
50. June 7	8:35 p.m.	Murray and Garvin	NW	12	880	0	0	(3)	0	Tornado path from Davis to Wynnewood.
51. June 8	9:20 p.m.	Woods	N	(1)	(1)	0	0	0	0	Tornado funnel observed aloft 3 miles west of Alva.
52. June 12	3:50 p.m.	Payne	NE	(2)	(4)	0	0	400	0	1 farmstead damaged southeast of Stillwater.
53. June 14	Afternoon and evening.	Woods	NE	(1)	(1)	0	0	0	0	Tornado funnel observed 12 miles north of Waynoka.
54. June 28	6 p.m.	Haskell	NE	[6] 50	20	0	0	2,500	0	Damage to buildings on farm 6 miles east of Stigler.
55. June 29	(1)	Cimarron	(1)	(1)	(1)	0	0	0	0	2 funnels observed 10 to 15 miles north
56. June 29	(1)	Cimarron	(1)	(1)	(1)	0	0	0	0	and northwest of Boise City.
57. July 8	4:50-4:54 p.m.	Kiowa	ENE	(2)	(4)	0	0	0	0	Small funnel cloud observed in open field 10 miles northeast of Hobart.
58. July 15	8:20 a.m.	Seminole	(1)	3/4	880	0	0	10,000	0	Several garages, a concession stand, and trees twisted and scattered 2 miles northwest of Seminole.
59. July 23	4:45 p.m.	Coal	(1)	1/4	440	0	0	300	0	Truck on road overturned 1/2 mile southeast of Centrahoma.
60. July 23	6:45 p.m.	Payne	E then S	[6] 300	100	0	1	3,000	0	Damage to business houses and 5 homes in Ripley. Storm came from west circled and struck town from north.
61. Aug. 30	1:30-1:32 p.m.	Tillman	(1)	[6] 200	300	0	0	500	0	3 miles northeast of Frederick.
62. Aug. 30	2-2:20 p.m.	Hughes	SE	6	440	0	0	1,000	0	Several buildings damaged at Calvin.
63. Sept. 7	3-3:30 p.m.	Pontotoc	NE	3-4	200	0	0	55,000	0	Damage to outbuildings of Amerada Oil Co. Some damage to utility lines 3 miles southwest of Stonewall.
64. Sept. 20	8-9:30 p.m.	Bryan	NE	4	(1)	0	1	5,000	0	In vicinity of Durant, damaged livestock commission barn, factory, homes, and barns.

See reference notes at end of table.

TORNADO DATA

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
OKLAHOMA (Cont'd)										
65. Sept. 29	3:20-3:22 p.m.	Oklahoma	NE	1/8	50-100	0	0	$50,000	$ 0	Store building destroyed; 5 adjacent store buildings damaged; 10 nearby houses damaged; 2 automobiles crushed under debris of store building in Oklahoma City.
66. Sept. 29	Afternoon	Pittsburg	(1)	(1)	(1)	0	0	0	0	3 tornado funnels sighted. 1. 6 miles south of McAlester.
67. Sept. 29	Afternoon	Garvin	(1)	(1)	(1)					2. 5 miles southwest of Wynnewood.
68. Sept. 29	Afternoon	Seminole	(1)	(1)	(1)					3. North of Seminole.
69. Oct. 25	6:30 p.m.	Ellis	NE	7	1,500	0	0	500	0	Occurred 7 miles south of Fargo.
OREGON										
1. Oct. 22	3:45 p.m.	Washington	SE	1/2	10-15	0	0	0	0	While a true tornado it barely touched ground, if at all, and lasted only 10 minutes. Occurred several miles west of Cedar Hills area between Hillsboro and Orenco.
PENNSYLVANIA										
1. March 15	9 p.m.	Mifflin	(1)	(2)	(4)	0	0	(3)	(3)	Near Siglerville. Funnel-like cloud unroofed haymow, scattered straw bales, and felled fence.
2. April 17	2 a.m.	Susquehanna	NE	(2)	(4)	0	0	(3)	0	Near Lenoxville. Part of larger storm which lasted 30 minutes. Damaged 4-car garage, destroyed barn, scattered hay bales, and damaged trees and wires.
3. April 17	2 a.m.	Berks	(1)	(2)	(4)	0	0	(5)	0	Green Hills golf course near Reading. Uprooted trees and carried building across roadway.
4. April 22	2 p.m.	Somerset	E	(1)	(4)	0	0	(5)	0	Near Boynton. Small hit-skip tornado made noise like 6 diesel engines at once. Lifted water 20 feet into air from creek, then scattered it. Ripped wash from line and strung it through trees.
5. April 25	5:30-6p.m.	Adams and York	E	15	100-800	0	0	(3)	(3)	Gettysburg-McSherrystown-Hanover area. Funnel-shaped cloud. 600 TV aerials wrecked. Heavy tree, wire, and chimney damage. Several buildings and barns suffered major damage. Started as active thunderstorm.
6. April 27	Afternoon	Clearfield	(1)	(1)	(4)	0	0	(3)	0	Tornado-like wind cut swath across Westover Borough near Clearfield. Uprooted trees, broke windows, felled wires, and knocked groceries from shelves as it rocked buildings.
7. May 3	Night	Clinton	(1)	3/4	(4)	0	0	3,000	(3)	Small tornado near Renovo. Uprooted 2 milk houses, demolished 3-car garage, damaged barn and home, and blew over 30 apple trees.
8. June 1	3 p.m.	Fayette	(1)	(2)	(4)	0	0	3,000	(3)	Near tornado near Ohiopyle. Smashed 100-foot building, pulled posts from ground, and destroyed 3 fruit trees.
9. June 1	Evening	Clarion	E	(2)	(4)	0	0	(3)	(3)	Near Knox. Large bank barn and 3 houses unroofed, orchard uprooted, and tree tops twisted by hit-skip tornado.
10. June 1	6:30 p.m.	Butler	N	10	50-150	0	0	15,000	2,100	Weaving path in North Oakland-Chicora area. Noise like thousands of people yelling at once. Exploded barn and garage. Damaged houses, farm buildings, roofs, trees, wires, oil derricks, livestock, and crops. Funnel cloud seen.
11. June 1	Afternoon	Mercer	(1)	(2)	(4)	0	2	(3)	0	Near Grove City. 8-room house moved 12 feet off foundation.
12. June 10	7:30-10:30 p.m.	Beaver and Lawrence	N	10	(4)	0	3	3,500	(5)	Hit-skip path New Brighton-Ellwood City area. Buildings, trees, wires damaged. Highways cluttered by debris.
13. June 10	9:20-11 p.m.	Allegheny	(1)	(2)	(4)	0	0	(5)	0	Baby twister near Donaldson's Corners ripped out 16 trees, severely damaged other tree tops.
14. June 12	10:20 p.m.	Potter	NE	6 300	200	0	0	9,000	0	Near Keating Summit. Very local; milled around in valley. Demolished 1 house and garage, moved others on their foundations, damaged roofing and siding on others, and twisted and uprooted trees. Loudly shrieking winds.
15. June 26	2:25 p.m.	Westmoreland	NE then S	(2)	65	0	0	(3)	(3)	Funnel-shaped cloud in Madison-Arona area. Smashed large barn, uprooted scores of trees, tossed water from lake, damaged school and several houses, destroyed 5 acres of trees, overturned 2 trailers out of 4 in group, and disrupted power, phone, and water services.

See reference notes at end of table.

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons: Killed	Number of persons: Injured	Estimated damage: Property (exclusive of crops)	Estimated damage: Crops	Remarks
PENNSYLVANIA (Cont'd)										
16. July 5	9:50-11:30 a.m.	Clearfield	(1)	(1)	(4)	0	1	$ (3)	$ (3)	Hit-skip path near Madera. Damaged 2 barns and silo, and uprooted tree.
17. July 5	10:30-11:30 a.m.	Armstrong and Indiana	E	15-20	(1)	0	0	(3)	(3)	In Elderton-Purchase Line area. Hit-skip wind and hail storm with periodic tornado action. 2 barns demolished. 4 other barns, 1 house, and other farm buildings damaged. Corn fields stripped of leaves, grain fields flattened, and garage lifted, then dropped nearly in place.
18. July 29	4 p.m.	Erie	SE then N	(2)	(4)	0	0	(5)	0	Funnel with 80 m.p.h. winds struck southern section of city of Erie. Noise like jet plane and electric motor.
19. July 31	8 p.m.	Bucks	(1)	2	(1)	0	5	(3)	0	Hit-skip twister-like winds near Quakertown. 60 m.p.h. winds nearly leveled a carnival, injured 5 persons seriously, and did other structural damage.
20. Sept. 19	Evening	Northumberland, Columbia, and Schuylkill	SE	(1)	(1)	0	0	(3)	(3)	Ashland-Mahanoy City area. Scores of trees twisted and/or uprooted. Large steel powerline pole twisted and crashed, disrupted main power circuits.
21. Sept. 19	5:30-6:30 p.m.	Sullivan	ESE	18	50	0	0	11,000	(5)	Hit-skip through Lincoln Falls-Estella-Satterfield. Noise like terrifying roar. 3 farms heavily damaged. Other building, tree, and wire damage.
22. Sept. 19	5:30-6:30 p.m.	Bradford	E	(1)	25-200	0	0	(3)	(3)	North section of LeRaysville. Demolished hay barn, damaged house roof, toppled chimney, and moved house off its foundation. Wire fence and posts torn out of ground. 2 acres of buckwheat uprooted, and scattered along 3-mile path.
23. Sept. 30	Evening	Mercer	(1)	(1)	(1)	0	0	(3)	(3)	Near Sharpsville. About a dozen homes wrecked, barn demolished, trees uprooted, wires downed, and 8 cows killed.
RHODE ISLAND										
(None reported)										
SOUTH CAROLINA										
1. Feb. 16	8:02 p.m.	Cherokee	(1)	1	50	0	0	3,000	0	At Gaffney, funnel cloud seen dipping.
2. Feb. 28	10:35 p.m.	Richland	(1)	(1)	(1)	0	0	300	0	At Columbia, very small, with characteristic noise.
3. March 14	2 a.m.	Orangeburg	(1)	(1)	(1)	0	0	8,000	(3)	Tornadic manifestations 3 miles north of Springfield.
4. March 14	2:10 a.m.	Aiken	(1)	1	800	0	4	T✓ 100,000	0	Tornadic manifestations at White Pond.
5. March 31	10 a.m.	Kershaw	(1)	(1)	(1)	0	0	10,000	0	Tornadic effects at Kershaw.
6. March 31	5:45 p.m.	Lexington	(1)	(1)	(1)	0	2	2,000	0	Suspected tornado at Lexington.
7. March 31	7 p.m.	Orangeburg	(1)	(1)	(1)	0	1	3,000	0	Suspected tornado at Orangeburg.
8. May 3	3:30 p.m.	Oconee	(1)	(1)	(1)	0	0	1,000	0	Suspected tornado at Westminster.
9. June 23	Afternoon	Chester	(1)	(1)	(1)	0	0	T✓ 5,000	0	Suspected tornado at Chester.
SOUTH DAKOTA										
1. May 27	12:58 p.m.	Davison, Hanson and McCook	NE	14	150	0	2	49,000	0	From 6 miles west and 2 miles south of Ethan to 3 miles south of Alexandria to Unityville. Damage to 23 farms in tri-county area. Accompanied by hail 2 inches in diameter.
2. May 27	6:55 p.m.	Union	NE	(2)	(4)	0	0	5,000	0	Occurred at Elk Point. Damage indicated considerable skipping action.
3. June 10	11:55 p.m.	Brule	E	1	30	0	0	6,000	0	Several buildings on 1 farmstead demolished at Pukwana, 4 miles south of Brule.
4. June 11	12:55 a.m.	Spink	NE	1	40	0	0	500	0	Small tornado partially destroyed 1 building 10 miles west of Carpenter.
5. June 11	1:15 a.m.	Day	NE	2	(4)	0	0	(3)	0	4 buildings demolished in small local area 8 miles north of Crandall.
6. June 18	3:55 a.m.	Bon Homme and Yankton	NE	40	(4)	0	0	40,000	(3)	Same cloud formation with funnel cloud skipping over 2-county area. Moderate to heavy damage to 7 farms. Moved from 7 miles southeast of Tyndall to 5 miles northeast of Utica, to southwest of Mansfield, to northeast of Irene.
7. June 18	4:40 a.m.	Turner	NE	4	50	0	0	(3)	0	Several barns and several groves of trees sustained heavy damage. Moved from 2 miles southwest to 3 miles northwest of Marion.
8. June 19	6:40 p.m.	Lincoln	NE	3	50	0	0	(3)	0	Considerable skipping action of funnel cloud formation. 3 farmsteads were

See reference notes at end of table.

Table 11—Continued

TORNADO DATA

Year 1954

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons: Killed	Number of persons: Injured	Estimated damage: Property (exclusive of crops)	Estimated damage: Crops	Remarks
SOUTH DAKOTA (Cont'd)										
								$	$	affected. Occurred 3 miles south of Harrisburg.
9. July 15	7:30 p.m.	Lawrence	NE	1/4	20	0	0	(5)	0	Occurred at Deadwood. Small tornado accompanied by heavy rain, severe lightning, and hail.
10. July 29	4:30 p.m.	Charles Mix	NE	5	(4)	0	0	(3)	(3)	Buildings on 12 farms damaged, 6 miles south of Wagner.
11. Aug. 1	2 p.m.	Walworth	(1)	(1)	(1)	0	0	0	0	Funnel cloud east-southeast of Mobridge did not reach ground.
12. Aug. 1	5:30 p.m.	Gregory	SE	25	(4)	0	2	85,000	(3)	Buildings on 12 farms damaged. Formed 9 miles northwest of Gregory, moved to southern edge of Burke.
TENNESSEE										
*1. April 28	7:15 p.m.	Hardin	NE	2	300	0	4	55,000	0	Store destroyed, several automobiles damaged, roofs torn off, and powerlines downed at Walkertown. Crossed from Mississippi.
2. May 3	9:45 a.m.	Obion	NE	3	300	0	0	5,000	0	350 phones out of order, roofs of 4 business houses and 3 homes damaged at Union City.
TEXAS										
1. Feb. 19	5:20 a.m.	Eastland	NE	(1)	15	0	2	7,500	0	13 buildings destroyed; 18 houses and 20 other buildings damaged in Gorman.
2. Feb. 19	9:30 a.m.	Wood and Franklin	NE	(1)	(1)	0	0	4,000	0	Oil derrick torn from moorings; house unroofed, other buildings damaged; greenhouse destroyed near Winnsboro.
3. Feb 19	1:30 p.m.	Montgomery	NE	(1)	150	0	7	200,000	0	4 homes and 10 other buildings destroyed; 9 homes and 4 other buildings damaged; timber broken; touched ground 3 times near Conroe.
4. March 24	9:30 p.m.	Collin	E	5	(1)	0	0	12,000	0	1 grain elevator completely demolished; windows blown out; houses unroofed; barns, sheds, TV antennas damaged at Frisco.
5. April 11	4:41 p.m.	Reeves	(1)	(1)	(1)	0	0	0	0	Pilot reported twister-type cloud, extending cloud to ground, 1 mile in diameter; centered 10 miles east of northern tip of Red Bluff Reservoir. Cloud dissipated before causing any damage in sparsely settled section.
6. April 14	(1)	Fayette	(1)	(1)	(1)	0	0	(3)	0	2 barns destroyed north-northwest of Schulenburg.
7. April 15	9 a.m.	Newton	NE	1/2	200	0	0	1,000	0	Moved house from foundation; powerlines disrupted; trees snapped at Trout Creek community.
8. April 15	Noon	Harris	(1)	(1)	(1)	0	0	(3)	0	Barn unroofed, carbon plant roof damaged; supporting posts to porch of house knocked out. Touched ground twice near Fairbanks.
9. April 15	5:37 p.m.	Matagorda	(1)	(1)	(1)	0	0	7,000	0	New barn destroyed; 4 houses, powerlines, and TV antennas damaged at Markham.
10. April 15	(1)	Bexar	(1)	(1)	(1)	0	0	(3)	(3)	Barn lifted and collapsed in air. At least 6 farms bad damage near Elmendorf.
11. April 15	(1)	Hays	(1)	(1)	(1)	0	0	0	0	Highway Patrol reported tornado cloud over San Marcos.
12. April 15	(1)	Guadalupe	(1)	(1)	(1)	0	0	0	0	Tornado cloud reported near Seguin; may have been same as tornado near Elmendorf.
13. April 21	2:20 p.m.	Pecos	N	1	880	0	0	3,500	0	Roofs ripped from 2 homes, several damaged 8 miles north of Fort Stockton.
14. April 21	Afternoon	Reeves	(1)	(1)	(1)	0	0	0	0	Tornado reported northwest of Pecos; not known to have reached ground.
15. April 21	5:10 p.m.	Midland	(1)	(1)	(1)	0	0	0	0	Pilot informed Weather Bureau at Midland Airport that small tornado existed back of thunderstorm which was in progress at station. No damage reported, probably did not reach ground.
16. April 21	7:42 p.m.	Borden	(1)	(1)	(1)	0	0	0	0	Tornado sighted by Texas Highway Patrol near Gail.
17. April 21	8 p.m.	Dawson	(1)	(1)	(1)	0	0	0	0	Department of Public Safety reported tornado in contact with ground 10 miles south of Lamesa, but no damage occurred.
18. April 21	9:15 p.m.	Garza	(1)	(1)	(1)	0	0	0	0	Tornado 12 miles southwest of Post, sighted by ranch foreman; dipped to ground on ranch land.
19. April 27	2 p.m.	Howard	NE	(1)	(1)	0	0	(5)	0	Tornado reported about 10 miles north of Big Spring; damage slight on account of open country.
20. April 27	2 p.m.	Scurry	(1)	(1)	(1)	0	0	0	0	2 tornadoes sighted over Lake J. B.

See reference notes at end of table.

Table 11—Continued

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
TEXAS (Cont'd)										
21. April 27	2 p.m.	Scurry	(1)	(1)	(1)	0	0	$ 0	$ 0	Thomas near Snyder.
22. April 27	6:30 p.m.	Runnels	SW	(1)	(1)	0	0	(3)	0	Funnel-shaped cloud took roof from home in Ballinger; demolished chicken house; blew windows in; unroofed and moved garages from foundations.
23. April 28	5 p.m.	Bosque	(1)	2	100	0	0	(3)	0	2 tornadoes formed 6 1/2 miles east of Clifton and 1 1/2 miles north of Coyote. Stayed in air most of time, but one dipped and broke electric line, unroofed barn, destroyed a few small buildings, and moved a house from its foundation. Braniff Airlines pilot saw clouds.
24. April 28	5 p.m.	Bosque	(1)							
25. April 29	2:50 p.m.	Runnels	E	(1)	(1)	0	1	(3)	0	Tornado struck Hatchel and Norton communities. Sheep pens destroyed; barn blown into house, causing considerable damage.
26. April 29	(1)	Taylor	(1)	(1)	(1)	0	0	0	0	Tornado reported 10 miles north of Abilene; no damage found.
27. April 30	12:30 a.m.	Hamilton	(1)	6	880	0	0	15,000	1,200	Tornado dipped several times at Fairy; 8 homes and 14 other buildings damaged; several windmills and TV antennas blown down and completely destroyed; some chickens and sheep killed.
28. April 30	5:37 a.m.	Hays and Caldwell	ENE	15	(1)	0	0	100,000	0	Tornado damaged gin, homes, outbuildings, and TV antennas at Kyle-Lytton Springs; trees uprooted.
29. April 30	6:10 a.m.	Milam, Leon, Williamson, Robertson, and Houston	NE	140	880	0	6	200,000	0	Tornado originated 5 miles southwest of Coupland; traveled northeastward to Grapeland, through Gause. Heavy damage to barns and homes at Coupland and Beyersville. 3 gins and 3 homes completely demolished. 2 cars crushed, and other buildings damaged.
30. April 30	6:30 a.m.	Lee, Fayette, and Washington	NE	20	880	0	2	11,000	1,000	Tornado damaged and destroyed houses and barns, killed poultry and livestock at Serbin and Northrup communities. Continued through Carmine and La Babia communities.
31. April 30	7:30 a.m.	Brazos	(1)	(1)	(1)	0	0	(3)	0	Tornado demolished 2 churches and 2 homes 2 1/2 miles south of Bryan. Cloud confirmed by CAA and College Station.
32. April 30	8 a.m.	Trinity, Angelina, and San Augustine	NE	70	880	0	23	65,000	25,000	Planing mill blown down at Groveton; chicken house destroyed; homes damaged by falling trees. Timber badly damaged as tornado moved through Angelina County to near San Augustine.
33. April 30	9:05 a.m.	Brazos	(1)	(1)	(1)	0	0	(3)	(3)	Funnel not reaching ground reported by A&M College at College Station. Same storm reported at Tabor, where considerable damage reported on plantation; damage of $6,000 to barn on another nearby farm.
*34. April 30	10 a.m.	Morris and Cass	NE	36	50	0	1	12,000	0	Tornado severely damaged or destroyed 5 buildings at Lone Star (9 miles south of Daingerfield). At Atlanta, house blown from foundation; barn unroofed; also damaged house and 2 barms near Bloomburg, 8 miles east of Atlanta. Tornado moved into Arkansas.
*35. April 30	10:30 a.m.	Bowie	NE	2	440	0	0	7,000	0	Tornado demolished 1 home, unroofed store, damaged 1 home and other buildings, and uprooted trees in College Hill community (7 miles south of DeKalb). Tornado moved into Arkansas.
*36. May 1	1:45-3:15 p.m.	Foard and Wilbarger	NE	40	(1)	0	2	100,000	1,300	In Vernon, 4 houses swept away; 5 others damaged. Scores of barns and outbuildings lost; 1 car destroyed. In vicinity of Crowell and Elliott, 5 sets of barns and outbuildings destroyed; 2 homes and oil mill unroofed; 3 homes demolished. Lightning killed 2 head of cattle. Storm crossed Red River into Oklahoma.
37. May 1	7 p.m.	Jack	(1)	(1)	(1)	0	4	(3)	0	Destroyed 1 home in Antelope.
38. May 1	P.m.	Fannin	(1)	(1)	(1)	0	0	(3)	0	Barns and outbuildings damaged in Mulberry and Ravenna areas. Trees twisted and broken.
39. May 1	P.m.	Clay and Montague	E	(1)	(1)	0	0	(3)	0	Near Buffalo Springs, barns, fencing, and timber damaged. Market unroofed at Bowie.
40. May 2	1 a.m.	Comanche	(1)	(1)	(1)	0	0	(3)	0	Garage destroyed and chicken house lifted from foundation at De Leon.
41. May 2	6:50 a.m.	Gregg	(1)	(1)	(1)	0	0	(3)	0	Roof of lumber company blown off at Gladewater.

See reference notes at end of table.

TORNADO DATA

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
TEXAS (Cont'd)										
42. May 2	(1)	Henderson	(1)	(1)	(1)	0	4	$ (3)	$ 0	11 miles east of Athens, 1 home destroyed and 2 others damaged.
43. May 6	8 a.m.	Hunt	(1)	(1)	(1)	0	0	(3)	0	Barns, tractor, and shed destroyed, and trees uprooted in South Sulphur community by suspected tornado.
44. May 6	P.m.	Eastland	(1)	(1)	(1)	0	0	(3)	0	Dairy building unroofed; fences and trees damaged at Hilburn community (8 miles northwest of Rising Star).
45. May 10	2:30 p.m.	Leon	(1)	(1)	(1)	0	0	(3)	0	Home damaged; several barns damaged or destroyed near Normangee.
46. May 11	8 p.m.	Grimes	(1)	(1)	(1)	0	0	(3)	0	Barns, sheds, and billboards destroyed near Navasota.
47. May 11	8:22 p.m.	Williamson	(1)	(1)	(1)	0	0	0	0	Funnel-shaped cloud, not touching ground, reported near Cedar Park.
48. May 11	P.m.	Lavaca	E	(1)	(1)	0	0	(3)	0	Sheds blown down, buildings and barns damaged near Ezzell and Provident areas.
49. May 12	1:20 a.m.	Chambers	(1)	(1)	(1)	0	0	(3)	0	6-room house moved from foundation and 2 outbuildings destroyed at Hankamer.
50. May 17	1:39 p.m.	Armstrong	(1)	(1)	(1)	0	0	0	0	Tornado cloud, not touching ground, reported near Goodnight.
51. May 17	(1)	Cooke	(1)	(1)	(1)	0	0	0	0	Tornado cloud, not touching ground, reported near Gainesville.
52. May 17	(1)	Andrews	(1)	(1)	(1)	0	0	0	0	Tornado cloud, not touching ground, reported near Andrews.
53. May 18	(1)	Bosque	(1)	(1)	(1)	0	0	(3)	(3)	Houses unroofed, windmill twisted, and oats ruined near Mosheim.
54. May 19	8:28 a.m.	Galveston	(1)	(1)	(1)	0	0	0	0	Tornado cloud sighted southeast of Galveston.
55. May 19	1:25 p.m.	Bastrop	(1)	50	(1)	0	0	1,000	0	1600 square feet of roofing blown from cotton storage yard, and other roofs damaged at Elgin.
56. May 22	9 p.m.	Hemphill	(1)	(1)	(1)	0	0	(3)	2,500	Funnel hit 200 yards southeast of house in Gem and demolished several sheds, pulled posts from ground, and uprooted trees.
57. May 25	6:15 p.m.	Hunt	(1)	(1)	(1)	0	0	0	0	Confirmed tornado reported 3 miles northeast of Royse City on teletype by Fort Worth and Dallas.
58. May 26	(1)	Jones	(1)	(1)	(1)	0	0	0	0	Tornado seen to touch ground near Anson.
59. May 27	1:20 a.m.	Comanche	(1)	(1)	(1)	0	0	0	0	Tornado seen to touch ground 5 miles north of De Leon.
60. May 28	8:45 p.m.	Tarrant	(1)	(1)	(1)	0	0	0	0	Highway patrol saw tornado cloud, not touching ground, 10 miles north of Forth Worth near Saginaw.
61. May 29	5:22 p.m.	Andrews	NW	(1)	(1)	0	9	(3)	0	Pilot reported tornado, touching ground, 15 miles south-southwest of Andrews; smashed oil-rig toolshed.
62. May 29	6 p.m.	Crane	(1)	(1)	(1)	0	2	(3)	0	Oil rig smashed 14 miles west of Crane. Engine house found 10 miles away from rig.
63. June 1	6 p.m.	Pecos	NE	8	880	0	0	2,600	0	3 funnel clouds, but only 1 touched ground, destroyed 1 barn, 2 windmills, and fencing at Bakersfield.
64. June 1	6 p.m.	Pecos	NE			0	0		0	
65. June 1	6 p.m.	Pecos	NE			0	0		0	
66. June 1	7:30 p.m.	Cottle	SE	25	(1)	1	14	1,000,000	1,611,500	A number of houses completely destroyed; many heavily damaged in Valley View, Salt Creek, Chalk, Sneedville, Hackberry, and Paducah; gymnasium at Valley View flattened; Buick building in Paducah destroyed. About 200 outbuildings completely destroyed in area. Wheat and cotton heavily damaged.
67. June 1	8:30 p.m.	Knox and Baylor	ENE	(1)	(1)	0	0	(3)	(3)	2 houses demolished, 18 damaged, and farm buildings damaged in vicinity of Vera. Some wheat wiped out.
68. June 1	8:55 p.m.	Wichita	SE	5	25-50	1	4	49,000	1,000	Tornado, formed 1 1/2 miles northeast of Iowa Park, destroyed 2 homes; also destroyed outdoor theatre screen and tower at Wichita Valley. Straight-line winds above 100 m.p.h. experienced at Wichita Falls, WBAS, before anemometer blown from support. Numerous reports of damage to signs, windows, roofs, and small buildings.
69. June 1	10 p.m.	Wichita	(1)	(1)	(1)	0	0	0	0	3 tornado funnels sighted, none touching ground, near Burkburnett.
70. June 1	10 p.m.	Wichita	(1)	(1)	(1)	0	0	0	0	
71. June 1	10 p.m.	Wichita	(1)	(1)	(1)	0	0	0	0	
72. June 1	P.m.	Floyd and Briscoe	N	(1)	(1)	0	3	(3)	(3)	Home completely demolished 20 miles west of Silverton; houses, outbuildings, wheat, and cotton crops damaged.
73. June 2	5:25 a.m.	Lamb	(1)	(1)	(1)	0	0	0	0	Funnel cloud sighted near Littlefield, apparently not touching ground.
74. June 2	5:30 p.m.	Delta	SE	7	1,000	1	8	T✓ 10,000	C	Destroyed 3 houses 3 miles northwest of Lake Creek and touched ground several times. Cotton and corn crops cut off or uprooted.
75. June 2	8 p.m.	Falls	(1)	(1)	(1)	0	0	(3)	0	Seedhouse picked up near Clarkson and deposited on pick-up truck; trees uprooted.

See reference notes at end of table.

TORNADO DATA

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
TEXAS (Cont'd)										
76. June 2	8:57 p.m.	McLennan	NE	(1)	(1)	0	0	$ 0	$ 0	Tornado cloud, not touching ground, lasted about 5 minutes near Lorena.
77. June 2	P.m.	Rains	(1)	(1)	(1)	0	0	(3)	(3)	In Lynch, Flats, and Smyrna communities, 2 houses blown down and 6 damaged; several farm buildings destroyed. Some crop damage.
78. June 11	8 p.m.	Brewster	SW	6	100	0	0	(3)	0	In Terlingua and Study Butte area, 2 windmills blown down; 2 houses unroofed and windows broken.
79. June 13	5:15 p.m.	Hutchinson	(1)	(1)	(1)	0	0	0	0	Funnel cloud reported, touching ground, northwest of Stinnett.
80. June 13	9 p.m.	Reeves	(1)	25	(1)	0	1	(3)	(3)	House torn from foundation and turned over; garage and pumphouse destroyed. Also 3,000 acres cotton total loss; 2,000 acres damaged.
81. June 14	2-4 p.m.	Upton, Crane, Howard, Midland, Glasscock, and Martin	NE	15	(1)	0	0	125,000	26,000	Blew away barns; blew lid off oil tank; destroyed cotton crops in 6-county area. Estimate in vicinity of Big Spring only of crop damage.
82. June 19	8 a.m.	San Patricia	(1)	(1)	(1)	0	0	0	0	Pilot reported funnel cloud, not touching ground, 3 miles north of Taft.
83. June 20	11:06 a.m.	Jefferson	(1)	(1)	(1)	0	0	0	0	Funnel cloud, not touching ground, reported 20 miles northwest of Jefferson County Airport.
84. June 22	P.m.	Nolan	(1)	(1)	(1)	0	0	(3)	(3)	Windshield and windows broken; crops damaged or destroyed.
85. June 30	(1)	Hardeman	(1)	(1)	(1)	0	0	600	0	Scattered part of a large feed barn about on farm east of Quanah.
86. July 6	3:40 p.m.	Colorado	NE	1/2	50	0	0	(3)	0	60-foot barn destroyed, porch blown off; trees blown down at Weimar.
87. July 8	4 p.m.	Hunt	(1)	(1)	(1)	0	0	(3)	(3)	Window panes broken, trees uprooted, sheds toppled, and barns unroofed in Concord community, 2 miles southwest of Greenville. Corn and cotton flattened.
88. July 12	5:50 p.m.	Bexar	(1)	(1)	(1)	0	0	(3)	0	Unroofed 2 barns and shed; scattered beehives near Selma.
89. July 18	6:40 p.m.	Rusk	NE	3/4	880	0	0	35,000	5,000	Buildings unroofed, garages, barns, and small buildings destroyed near Tatum. Gymnasium demolished.
90. July 26	5 p.m.	Grimes	SW	(1)	(1)	0	0	(3)	(3)	6 miles north of Navasota, barns and small buildings destroyed, houses blown from foundations, trees uprooted, windows blown out, and cotton damaged.
91. Aug. 27	10:10 a.m.	Nueces	(1)	(1)	(1)	0	0	0	0	Waterspout 8 miles south of Port Aransas.
92. Aug. 30	3:03 p.m.	Kimble	(1)	(1)	(1)	0	0	0	0	Small tornado, not touching ground, 20 miles southeast of Junction.
93. Aug. 31	1:45 p.m.	Anderson	S	1/2	300	0	0	8,000	0	School and several small residences damaged at Elkhart.
94. Sept. 29	5:20 p.m.	Dallas	E	(1)	(1)	0	0	0	0	Funnel cloud sighted by WBAS at Dallas.
95. Sept. 29	5:30 p.m.	Wise	N	(1)	(1)	0	0	1,500	0	Barn and chicken house unroofed at Chico.
96. Sept. 29	6:30 p.m.	Cooke	(1)	(1)	(1)	0	0	0	0	Tornado cloud seen 20 miles west of Perrin Field, not touching ground.
97. Sept. 29	(1)	Grayson	(1)	(1)	(1)	0	0	(3)	0	3 small twisters near Whitesboro blew shingles from barn roofs, toppled several barns and sheds.
98. Sept. 29	(1)	Grayson	(1)	(1)	(1)	0	0		0	
99. Sept. 29	(1)	Grayson	(1)	(1)	(1)	0	0		0	
100. Oct. 1	4 p.m.	Jeff Davis	(1)	(1)	(1)	0	0	900	200	Removed roof of barn and damaged crops in storage near Valentine.
101. Oct. 11	6 p.m.	Palo Pinto	E then N	(1)	440	0	0	1,600	0	Severe damage to only home in path in Salesville.
102. Oct. 13	11:59 a.m.	Galveston	N	(1)	(1)	0	0	0	0	Funnel cloud observed 11 miles north-northwest of Galveston, not touching ground.
103. Oct. 14	11:30 a.m.	Brazoria	N	(1)	(1)	0	0	0	0	Funnel cloud, not touching ground, observed 5 miles west of Freeport.
104. Oct. 22	8 a.m.	Madison	NE	12	100	0	0	6,000	0	Struck 1/2 mile southwest of North Zulch, rose, then struck Cottonwood community, unroofed several barns, overturned garages and windmill, shifted house from foundation and blew out windows.
105. Oct. 22	5 p.m.	Victoria	(1)	(1)	(1)	0	1	10,000	0	Small buildings overturned and flattened, stadium blown down, 10 homes and 15 other buildings damaged at Bloomington.
106. Oct. 22	7 p.m.	San Patricio	(1)	15	(1)	0	25	400,000	0	25 homes destroyed, 250 damaged, 18 other buildings destroyed and 20 damaged at Portland.
UTAH										
1. May 25	Noon	Rich	NE to N	(2)	(4)	0	0	8,000	0	At Laketown 2 barns blown down, trees uprooted, and small outbuildings tipped over. No funnel seen as it became dark, and blowing wind filled air with debris.

See reference notes at end of table.

TORNADO DATA

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
VERMONT										
1. Feb. 12	9:15-11:40 a.m.	Chittenden	S	2	(1)	0	0	$ 0	$ 0	On Lake Champlain near Burlington. Waterspout with 30 to 40 complete funnels which remained entirely over open water, more than a mile from shore.
VIRGINIA										
1. March 1	5:10 a.m.	Brunswick	(1)	(1)	(1)	0	0	(5)	0	Occurred at Dolphin. Destroyed numerous sheds and outbuildings; blew down utility lines and TV antennas.
*2. May 3	P.m.	Loudoun	NNE	(1)	(1)	0	0	(5)	0	Occurred at Lovettsville. Damage to telephone- and powerlines, roofs, and buildings. Crossed river to Brunswick, Md.
3. June 26	P.m.	Essex	(1)	(1)	(1)	0	0	(5)	0	Occurred at Tappahannock.
4. Aug. 5	7 p.m.	Norfolk	E	(1)	(1)	0	0	0	0	Funnel cloud observed aloft in vicinity of Norfolk.
5. Aug. 15	2:30 p.m.	Halifax	(1)	(1)	(1)	0	0	(3)	(3)	Occurred at Turbeville.
6. Sept. 7	2:15 p.m.	Fauquier	E	4	(4)	0	0	(3)	(3)	From 2 miles south of Delaplane to 1 mile southeast of Rectortown. Poultry house demolished, several barns partly unroofed, and many trees downed.
WASHINGTON										
1. June 15	1:30 p.m.	Spokane	SW	1/2	100	0	0	6,000	0	1 barn leveled, roofs blown from other buildings, and trees damaged at Spangle. It is a very debatable question as to whether this was a very large dust devil or a very small tornado. If it was a tornado, it was very small in comparison to most tornadoes.
WEST VIRGINIA										
1. July 14	P.m.	Tucker	(1)	(1)	(1)	0	0	300,000	(3)	Occurred at Thomas and Pierce.
2. Aug. 16	5 p.m.	Berkeley	S	(1)	(1)	0	0	0	0	Funnel cloud observed at Falling Waters.
3. Aug. 16	P.m.	Tucker	(1)	(1)	(1)	0	0	(3)	(3)	2 buildings damaged at Parsons.
WISCONSIN										
1. April 7	5:45 a.m.	Iowa	NE	6-8	400	0	4	60,000	300	Path 6 miles north of Highland to 3 miles southeast of Avoca. No funnel observed. 1 farm home destroyed, 7 others damaged, 13 farm buildings destroyed and 37 damaged.
2. April 7	1:15 p.m.	Waukesha	NE	(1)	(1)	0	0	50,000	0	No funnel observed; resulting damage gave evidence of tornado-type winds. Occurred at Oconomowoc.
3. April 7	Late a.m.-p.m.	Fond du Lac	E	(1)	(1)	0	0	30,000	0	Evidence of possible tornado. 1 barn demolished. Roof of 140-foot barn loosened from its mooring. Cement silo roof set on ground. Occurred at Mt. Calvary.
4. April 15	3 p.m.	Waushara	NE	(1)	(1)	0	0	10,000	0	Passed over or near 3 communities, Neshkoro, Lohrville, and Redgranite.
5. April 26	3:25 p.m.	La Crosse and Trempealeau	N	(1)	(1)	0	0	600	0	Black funnel observed at Camp Decorah between Holmen and Galesville.
6. April 26	4 p.m.	Grant	(1)	(1)	(1)	0	0	(3)	0	Unconfirmed tornado passed over 2 farmsteads north of Andover.
7. June 18	6:30 p.m.	Jackson	ESE	10	900	0	0	T✓ 100,000	C	Tornado centered over village of Hixton.
8. June 20	2:40 a.m.	Marathon	E	(1)	(1)	0	0	(3)	0	Characteristics of damage on 3 farms gave evidence of tornado passing over area near Mosinee.
9. June 20	A.m.	Calumet	(1)	(1)	(1)	0	0	(3)	(3)	Farmer's wife near Brothertown heard roar of wind, looked out farm-home window as barn and silo were flattened.
10. June 29	3:30 p.m.	Pierce	NE	6	(1)	0	0	T✓ 5,000	C	Unconfirmed tornado over Herbert community, 8 miles southeast of Ellsworth.
11. July 6	P.m.	Jefferson	(1)	(1)	(1)	0	0	0	0	Pilot reported waterspout over Lake Koshkonong.
12. July 30	7 p.m.	Columbia	ESE	8	200	0	0	T✓ 80,000	C	Malformed funnel observed at Lodi and vicinity.
13. Aug. 15	6 p.m.	St. Croix	E	6	(1)	0	0	T✓ 70,000	C	Occurred over New Richmond and vicinity. Residents described tornado as collison of 2 isolated cells, one from northwest and the other from southwest.
WYOMING										
1. May 22	10 p.m.	Goshen	W	6✓ 215	17	0	0	300	0	Barn damaged at Jay Em.
2. July 21	3:35 p.m.	Goshen	(1)	6✓ 15	10	0	0	1,000	0	Small tornado damaged roofs of 2 buildings at Torrington.

See reference notes at end of table.

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
ALASKA										
1. Feb. 14	9:58 a.m.	Baranof	S	(1)	(1)	0	0	$ 0	$ 0	Waterspout observed 2 miles east of weather station, and estimated about 800 feet high, and in contact with water. Clockwise rotation observed and funnel connected to scattered clouds moving southward. Just before formation of spout, there was a "terrific wind from south out of small bay inside Warm Springs Bay, causing a suction, lifting water at least 20 feet and making it look as if it were boiling." Area was under strong easterly gradient.
2. Feb. 23	9:13-9:16 a.m.	Annette Island (5 miles southeast of)	NE	(1)	(1)	0	0	0	0	Under southwesterly flow of unstable air, waterspout observed in vicinity of Hot Spur Island and moving to vicinity of Annette Point where it rapidly dissipated. Point of formation unknown. Funnel extended downward over water from base of cumulus cloud and approached, but was not observed to be in contact with surface. Cumulus clouds covered about 6/10 of sky with bases 1800 feet above sea level. Light rain showers were occurring at Annette.
HAWAII										
(None reported)										
WEST INDIES										
(None reported)										

* Denotes State-boundary crossing tornadoes.
C Damage to crops.
T Includes crop damage.
1 Datum not obtained.
2 Short.
3 Losses occurred; amount not reported.
4 Narrow.
5 Amount of damage described as small; no monetary estimate.
6 Yards instead of miles.
7 Several.

Table 12

TORNADO SUMMARY

YEAR 1954

State	January	February	March	April	May	June	July	August	September	October	November	December	Total
ALABAMA													
Number		1	2	1								5	9
Days		1	2	1								1	5
Deatbs		0	0	0								0	0
Injuries		0	0	1								45	46
Damage		5,200	25,300	20,000								357,000	407,500
ARIZONA													
Number			1					1					2
Days			1					1					2
Deaths			0					0					0
Injuries			0					0					0
Damage			0					0					0
ARKANSAS													
Number		6	2	10	5	3	2	1					29
Days		4	2	3	2	3	2	1					17
Deatbs		1	0	0	0	0	0	0					1
Injuries		29	4	3	0	1	0	0					37
Damage		1/400,700	15,000	1/397,700	1/6,500	28,000	5,000	18,000					1/870,900
CALIFORNIA													
Number						1							1
Days						1							1
Deaths						0							0
Injuries						0							0
Damage						10,000							10,000
COLORADO													
Number		1	5	2	1	2	1	1					13
Days		1	2	2	1	2	1	1					10
Deatbs		0	0	0	0	0	0	0					0
Injuries		0	1	0	0	0	0	0					1
Damage		2,000	8,000	600	0	400	(2)	(2)					1/11,000
CONNECTICUT													
Number					2								2
Days					1								1
Deaths					0								0
Injuries					2								2
Damage					22,000								22,000
DELAWARE													
Number							1						1
Days							1						1
Deaths							0						0
Injuries							0						0
Damage							1/2,000						1/2,000
DISTRICT OF COLUMBIA													
(None)													
FLORIDA													
Number	2	1		6	1	17	5	3	5	1	1		42
Days	1	1		3	1	5	4	3	3	1	1		23
Deatbs	0	0		0	0	0	0	0	2	0	0		2
Injuries	0	0		3	0	1	0	0	7	0	0		11
Damage	0	(3)		1/11,000	0	25,000	0	1/10,000	(3)	0	0		1/46,000
GEORGIA													
Number			6	3		1	2	3				11	26
Days			2	2		1	2	2				1	10
Deatbs			8	0		0	0	0				1	9
Injuries			125	0		2	0	0				44	171
Damage			1/9,532,500	1/28,500		8,000	1/5,300	17,500				1/515,800	1/10,107,600
Idaho													
Number				1		2							3
Days				1		1							2
Deaths				0		0							0
Injuries				0		0							0
Damage				0		5,000							5,000
Illinois													
Number			1	1	3		1			1			7
Days			1	1	3		1			1			7
Deaths			0	1	0		0			0			1
Injuries			3	13	2		1			0			19
Damage			250,000	246,000	105,000		60,000			10,000			671,000
Indiana													
Number			4	6	7	13	2	1		1			34
Days			3	2	4	8	2	1		1			21
Deatbs			0	0	0	0	0	0		2			2
Injuries			2	0	1	1	0	0		10			14
Damage			761,600	47,800	1/29,800	1/24,600	14,000	1,500		200,000			1/1,079,300
Iowa													
Number				15	3	2		1					21
Days				3	2	2		1					8
Deaths				1	0	1		0					2
Injuries				12	0	0		0					12
Damages				1,659,500	1/22,700	1/210,000		1/10,000					1/1,902,200
Kansas													
Number		1	23	12	18	17	5	13	2	3			94
Days		1	4	5	5	8	3	7	2	3			38
Deatbs		0	0	0	0	0	0	0	0	0			0
Injuries		0	0	0	0	0	0	2	0	0			2
Damage		0	1/44,700	1/18,800	1/149,000	1/80,800	1/8,000	1/27,000	(2)	54,000			1/382,300
Kentucky													
Number					1	1		1					3
Days					1	1		1					3
Deaths					0	0		0					0
Injuries					0	0		0					0
Damages					5,000	100,000		13,000					118,000
Louisiana													
Number		1		6	1		1	4					13
Days		1		4	1		1	3					10
Deaths		1		1	0		0	0					2
Injuries		4		7	0		0	0					11
Damage		2,500		1/136,000	0		0	50,000					1/188,500
Maine													
Number							1	1			1		3
Days							1	1			1		3
Deatbs							0	1			0		1
Injuries							0	1			0		1
Damage							20,300	10,000			0		30,300

See reference notes at end of table.

Table 12—Continued

TORNADO SUMMARY

YEAR 1954

State	January	February	March	April	May	June	July	August	September	October	November	December	Total
MARYLAND													
Number					1		1						2
Days					1		2						3
Deaths					0		0						0
Injuries					0		(4)						(4)
Damage					(2)		(3)						(2)
MASSACHUSETTS													
Number			3				1	1					5
Days			2				1	1					4
Deaths			0				0	0					0
Injuries			0				0	0					0
Damage			1/1,500				3,000	4,000					1/8,500
MICHIGAN													
Number				3	5	2		5		2			17
Days				2	1	2		3		1			9
Deaths				0	0	0		0		0			0
Injuries				2	0	0		0		0			2
Damage				33,500	548,400	(2)		1/10,000		15,000			1/606,900
MINNESOTA													
Number					1	6	1	4					12
Days					1	4	1	2					8
Deaths					0	0	0	0					0
Injuries					0	0	0	1					1
Damage					35,000	180,000	4,000	50,000					269,000
MISSISSIPPI													
Number	2	2		4	1	1	3					3	16
Days	1	1		2	1	1	3					2	11
Deaths	0	0		0	0	0	0					0	0
Injuries	2	20		2	0	3	0					35	62
Damage	13,500	403,500		1/11,000	500	10,000	1/30,000					1/810,000	1/1,278,500
MISSOURI													
Number			14	7	4	3		1	2				31
Days			2	3	3	3		1	2				14
Deaths			2	0	0	0		0	0				2
Injuries			3	3	0	0		0	0				6
Damage			1/312,000	1/226,000	211,000	(3)		7,500	3,000				1/759,500
MONTANA													
Number					1		2	1					4
Days					1		2	1					4
Deaths					0		0	0					0
Injuries					0		0	0					0
Damage					5,000		1/600	170,000					1/175,600
NEBRASKA													
Number			1	2	4	11	3	2					23
Days			1	2	3	7	3	2					18
Deaths			0	0	6	1	0	0					7
Injuries			0	0	16	1	0	0					17
Damage			0	15,000	1/450,000	1/182,000	1/20,500	1/2,700					1/670,200
NEVADA (None)													
NEW HAMPSHIRE													
Number							1						1
Days							1						1
Deaths							0						0
Injuries							0						0
Damage							25,000						25,000
NEW JERSEY (None)													
NEW MEXICO													
Number					5	1	1	1					8
Days					2	1	1	1					5
Deaths					0	0	0	0					0
Injuries					0	0	0	0					0
Damage					500	0	500	0					1,000
NEW YORK													
Number									1				1
Days									1				1
Deaths									0				0
Injuries									0				0
Damage									20,000				20,000
NORTH CAROLINA													
Number		1				3		2	1		2		9
Days		1				3		2	1		2		9
Deaths		0				0		0	0		0		0
Injuries		0				1		0	5		0		6
Damage		10,000				95,000		200,000	110,000		40,000		455,000
NORTH DAKOTA													
Number						4	1	1					6
Days						3	1	1					5
Deaths						0	0	0					0
Injuries						0	0	0					0
Damage						0	10,000	0					10,000
OHIO													
Number			1	1	5	2		2	1	1			13
Days			1	1	1	1		2	1	1			8
Deaths			0	0	0	0		0	1	0			1
Injuries			0	1	1	3		0	3	0			8
Damage			50,000	75,000	250,000	1/27,000		5,500	15,000	1,000			1/423,500
OKLAHOMA													
Number			9	19	20	8	4	2	6	1			69
Days			1	4	6	7	3	1	3	1			26
Deaths			0	0	2	0	0	0	0	0			2
Injuries			0	14	91	0	1	0	1	0			107
Damage			1/139,500	1/217,900	1/2,109,000	1/2,900	13,300	1,500	110,000	500			1/2,594,600
OREGON													
Number										1			1
Days										1			1
Deaths										0			0
Injuries										0			0
Damage										0			0
PENNSYLVANIA													
Number			1	5	1	8	4		4				23
Days			1	4	1	4	3		2				15
Deaths			0	0	0	0	0		0				0
Injuries			0	0	0	5	6		0				11
Damage			(2)	(2)	1/3,000	1/32,600	(2)		1/11,000				1/46,600

See reference notes at end of table.

Table 12—Continued

TORNADO SUMMARY

YEAR 1954

State	January	February	March	April	May	June	July	August	September	October	November	December	Total
RHODE ISLAND (None)													
SOUTH CAROLINA													
Number		2	5		1	1							9
Days		2	2		1	1							6
Deaths		0	0		0	0							0
Injuries		0	7		0	0							7
Damage		3,300	1/ 123,000		1,000	5,000							1/ 132,300
SOUTH DAKOTA													
Number					2	6	2	2					12
Days					1	4	2	1					8
Deaths					0	0	0	0					0
Injuries					2	0	0	2					4
Damage					54,000	1/ 46,500	(2)	1/ 85,000					1/ 185,500
TENNESSEE													
Number				1	1								2
Days				1	1								2
Deaths				0	0								0
Injuries				4	0								4
Damage				55,000	5,000								60,000
TEXAS													
Number		3	1	31	27	23	5	3	6	7			106
Days		1	1	8	15	9	5	3	1	5			48
Deaths		0	0	0	0	3	0	0	0	0			3
Injuries		9	0	33	21	30	0	0	0	26			119
Damage		211.500	12,000	1/ 448,700	1/ 104,800	1/ 2,825,700	1/ 40,000	8,000	1/ 1,500	418,700			1/ 4,070,900
UTAH													
Number					1								1
Days					1								1
Deaths					0								0
Injuries					0								0
Damage					8,000								8,000
VERMONT													
Number		1											1
Days		1											1
Deaths		0											0
Injuries		0											0
Damage		0											0
VIRGINIA													
Number			1		1	1		2	1				6
Days			1		1	1		2	1				6
Deaths			0		0	0		0	0				0
Injuries			0		0	0		0	0				0
Damage			(3)		(3)	(3)		(2)	(2)				(2)
WASHINGTON													
Number						1							1
Days						1							1
Deaths						0							0
Injuries						0							0
Damage						6,000							6,000
West Virginia													
Number							1	2					3
Days							1	1					2
Deaths							0	0					0
Injuries							0	0					0
Damage							1/ 300,000	(2)					1/ 300,000
WISCONSIN													
Number				6		4	2	1					13
Days				3		3	2	1					9
Deaths				0		0	0	0					0
Injuries				4		0	0	0					4
Damage				1/ 150,900		1/ 105,000	80,000	70,000					1/ 405,900
WYOMING													
Number					1		1						2
Days					1		1						2
Deaths					0		0						0
Injuries					0		0						0
Damage					300		1,000						1,300
ALASKA													
Number		2											2
Days		2											2
Deaths		0											0
Injuries		0											0
Damages		0											0
HAWAII (None)													
WEST INDIES (None)													
TOTALS													
Number	4	22	80	142	124	144	54	62	29	18	4	19	702
			*79	*136	*122							*16	*690
Days	2	17	29	57	63	87	50	47	17	15	4	4	392
	**2	**11	**16	**22	**23	**27	**24	**24	**12	**10	**3	**3	**177
Deaths	0	2	10	3	8	5	0	1	3	2	0	1	35
Injuries	2	62	145	102	136	48	1/ 8	6	16	36	0	124	1/ 685
Damages	13,500	1/ 1,038,700	1/ 11,275,100	1/ 3,798,900	1/ 4,125,500	1/ 4,009,500	1/ 642,500	1/ 771,200	1/ 270,500	699,200	40,000	1/ 1,682,800	1/ 28,367,400

* Corrected for boundary-crossing tornadoes.
** Tornado days for country as a whole.
1 Additional losses occurred.
2 Losses occurred; amount not reported.
3 Amount of damage described as small; no monetary estimate.
4 Several.

NUMBER OF TORNADOES, TORNADO DAYS, AND RESULTING LOSSES BY YEARS; 1916-1954

Table 13.

Year	Number reported	Number tornado days	Total loss of life	Most deaths in a single tornado	Total reported property losses	Number of tornadoes causing losses of	
						$100,000	$1,000,000
1916	90	36	150	30	$2,264,500	6	1
1917	121	38	509	101	15,007,700	22	5
1918	81	45	135	36	7,431,150	19	1
1919	65	35	206	59	6,861,500	9	2
1920	87	49	498	87	15,007,500	24	7
1921	106	55	202	61	5,456,300	13	1
1922	108	65	135	16	6,880,000	20	0
1923	102	59	109	23	2,968,725	8	0
1924	130	58	376	85	26,072,350	25	6
1925	119	64	794	689	24,039,900	29	1
1926	111	56	144	23	4,323,950	16	0
1927	164	63	540	92	43,455,650	28	7
1928	203	79	92	14	13,235,600	25	4
1929	197	73	274	40	10,112,400	30	1
1930	192	72	179	41	12,289,100	28	3
1931	94	57	36	6	3,215,900	7	1
1932	152	67	394	37	8,888,525	11	1
1933	260	96	362	34	16,190,640	31	5
1934	147	77	47	6	4,424,950	9	0
1935	182	77	70	11	4,661,430	15	0
1936	159	73	552	216	26,228,550	17	6
1937	148	76	29	5	3,155,875	11	0
1938	220	78	183	32	8,793,457	18	3
1939	155	75	87	27	5,891,930	10	2
1940	128	65	65	18	6,015,320	9	1
1941	118	57	53	25	4,492,650	15	0
1942	170	68	384	65	15,268,950	32	3
1943	155	63	58	5	12,198,400	25	4
1944	173	67	275	100	21,594,150	34	7
1945	126	68	210	69	22,069,800	25	8
1946	109	66	78	15	12,267,015	31	3
1947	171	80	313	169	23,994,680	42	5
1948	190	74	140	33	40,699,650	53	6
1949	262	84	212	58	27,367,380	45	7
1950	210	92	70	18	13,637,300	31	1
1951	300	119	34	6	29,484,275	27	7
1952	270	104	230	57	35,193,900	48	10
1953	532	151	516	116	224,345,900	43	15
1954	690	177	35	6	28,367,400	41	3
Sum	6,997	2,858	8,776	---	---	932	137
Median	155	68	---	---	---	---	---

Table 14

HAILSTORM LOSSES

Year 1954

Section	January		February		March		April		May		June		July	
	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops
Alabama			(1)		30,000	(1)	2/ 500	2/ 5,500						
Arizona												9,700	3/4/ 34,600	3/4/ 112,400
Arkansas			(5)	(5)	(5)	(5)	4/ 1,500	4/ 2,000	2/3/4/ 50,300	2/3/4/ 465,200	4/ 5,000	4/ 325,000	3,500	4/ 39,200
California														
Colorado						2,000	(5)	(5)	1,000	44,500	41,500	196,500	504,000	134,000
Connecticut										1,000	3/4/ 1,000	3/4/ 4,000	3/4/ 5,000	2/3/4/ 50,000
Delaware									(5)	(5)		(5)	(5)	(1)
District of Columbia									(5)	(5)		(5)	(5)	(1)
Florida			(5)	(1)			(5)	50,800		(1)		2/4/ 1,171,000		
Georgia					500	1,000	1,000	500				10,900		13,800
Idaho										(5)		2/ 12,000	2/ 15,000	2/ 195,000
Illinois					500		10,000		(1)	(1)	500	(1)	(1)	500,000
Indiana							7,900						12,000	213,200
Iowa							2/ 800,000	(1)			35,000	(1)	2/ 800	6,000
Kansas			115,000		439,000		19,800	41,200	125,000	661,000	38,000	2,664,000		4,300
Kentucky			500				4/ 5,000				500	4,500	4/ 6,000	4/ 96,500
Louisiana									(1)		(1)	(1)		
Maine											3/4/ 1,000	3/4/ 4,000	3/4/ 1,000	3/4/ 35,000
Maryland									(5)	(5)		(5)	(5)	(1)
Massachusetts									2,500	3/4/ 50,000	3/4/ 5,000	3/4/ 25,000	3/4/ 5,000	3/4/ 66,500
Michigan					(1)	100	(1)	500		200	2/ 1,000	47,000	2/4/ 50,000	1,700
Minnesota							2/ 2,000	8,000	5,000	10,000	3/4/ 1,404,000	3/4/ 224,000	1,080,000	1,995,000
Mississippi							(5)	75,000						
Missouri			187,000				40,000	5,000	1,000		6/ 25,000			
Montana									5,000		2/ 1,500	2/ 95,000	39,500	4,121,000
Nebraska							35,000	50,000	76,300	2,405,200	112,500	2,000,000	(5)	22,500

Table 14—Continued

HAILSTORM LOSSES

Section	August		September		October		November		December		Crop season April—Sept		Total		
	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property and crops
Alabama				1,000							2/ 500	2/ 6,500	2/ 30,500	2/ 6,500	2/ 37,000
Arizona	4/ 9,500	7,000									3/4/ 44,100	3/4/ 129,100	3/4/ 44,100	3/4/ 129,100	3/4/ 173,200
Arkansas	500	4/ 24,500	(5)	2/ 12,000							2/3/4/ 60,800	2/3/4/ 867,900	2/3/4/ 60,800	2/3/4/ 867,900	2/3/4/ 928,700
California											0	0	0	0	0
Colorado	125,800	179,300	4,500	115,000							2/ 676,800	2/ 669,300	2/ 676,800	2/ 671,300	2/ 1,348,100
Connecticut	2,000	3/4/ 900,000									3/4/ 8,000	2/3/4/ 955,000	3/4/ 8,000	2/3/4/ 955,000	2/3/4/ 963,000
Delaware	(1)	(5)									(1)	(1)	(1)	(1)	(1)
District of Columbia	(1)	(5)									(1)	(1)	(1)	(1)	(1)
Florida	(5)	(5)									(5)	2/4/ 1,221,800		2/4/ 1,221,800	2/4/ 1,221,800
Georgia											1,000	25,200	1,500	26,200	27,700
Idaho		6/ 56,000		(1)							2/ 15,000	2/ 263,000	2/ 15,000	2/ 263,000	2/ 278,000
Illinois		(1)	7,000,000	8,000							2/ 7,010,500	2/ 508,000	2/ 7,011,000	2/ 508,000	2/ 7,519,000
Indiana	9,000	3,000									28,900	216,200	28,900	216,200	245,100
Iowa	5,500	76,000	(1)	1,650,000							2/ 841,300	2/ 1,732,000	2/ 841,300	2/ 1,732,000	2/ 2,573,300
Kansas	1,467,000	2,459,000	6,000	32,000	200,000	225,000					1,655,800	5,861,500	2,409,800	6,086,500	8,496,300
Kentucky	4/5/ 27,000	371,000	3/4/6/ 15,000								3/4/6/ 53,500	4/ 472,000	3/4/6/ 54,000	4/ 472,000	3/4/ 526,000
Louisiana	(1)	(1)									(1)	(1)	(1)	(1)	(1)
Maine											3/4/ 2,000	3/4/ 39,000	3/4/ 2,000	3/4/ 39,000	3/4/ 41,000
Maryland	(1)	(5)									(1)	(1)	(1)	(1)	(1)
Massachusetts	1,500	3/4/ 85,000									3/4/ 14,000	3/4/ 226,500	3/4/ 14,000	3/4/ 226,500	3/4/ 240,500
Michigan		12,000		5,200		8,900					2/4/ 51,000	66,600	2/4/ 51,000	75,600	2/4/ 126,600
Minnesota	8,200	2/ 46,000									2/3/4/ 2,499,200	2/3/4/ 2,283,000	2/3/4/ 2,499,200	2/3/4/ 2,283,000	2/3/4/ 4,782,200
Mississippi									60,000	(5)	(5)	75,000	2/ 60,000	2/ 75,000	2/ 135,000
Missouri			1,000,000								6/ 1,066,000	5,000	6/ 1,253,000	5,000	1,258,000
Montana	34,600	2/ 5,320,800		100,500							2/ 80,600	2/ 9,637,300	2/ 80,600	2/ 9,637,300	2/ 9,717,900
Nebraska	157,000	790,000	10,000	65,000							390,800	5,332,700	390,800	5,332,700	5,723,500

See reference notes at end of table.

Table 14 -Continued

HAILSTORM LOSSES

Year 1954

Section	January Property	January Crops	February Property	February Crops	March Property	March Crops	April Property	April Crops	May Property	May Crops	June Property	June Crops	July Property	July Crops
Nevada														
New Hampshire											[3][4] 1,000	[3][4] 4,000	1,000	1,000
New Jersey											(5)	(5)	(5)	(5)
New Mexico							[3] 120,000	[3] 10,000	[3] 131,000	[3] 396,500		1,000		
New York											2,500	(1)	(1)	[2] 195,100
North Carolina							6,000	16,500		492,000	7,000	1,805,600		5,758,000
North Dakota											10,000	736,000	50,000	1,800,000
Ohio											[3][4][6] 130,000		[3][6] 1,500,000	
Oklahoma					14,500	5,000	29,000	95,800	52,000	1,212,000	40,000	70,000		
Oregon												15,500	(5)	(5)
Pennsylvania											(1)	[2][3] 15,000	(1)	[2] 1,000
Rhode Island														2,500
South Carolina								250,000	4,000	270,000	1,000			205,000
South Dakota									[3][6] 44,000		[2][3] 103,000	[2][3] 1,510,000	(1)	(1)
Tennessee							(5)	(5)	(5)				(5)	3,000
Texas					[2][4] 500		[2][4] 160,000	[2][4] 155,000	[2][4] 10,000	[2][4] 300,000	[2][4] 1,750,000	[2][4] 25,000	[2][4] 1,200	
Utah														
Vermont											[3][4] 25,000	[3][4] 175,000	1,000	10,000
Virginia									(5)	(5)		(5)	(5)	(5)
Washington									(5)		(5)		50,000	200,000
West Virginia									(5)	(5)		(5)	(5)	(5)
Wisconsin							(1)	[2] 20,000			[2] 20,000	(1)	[2] 71,000	[2] 155,000
Wyoming									6,500	11,000	2,000	175,000	1,000	31,000
Alaska													(1)	
Hawaii														
West Indies														
Total	0	0	[2] 302,500	(1)	[2][4] 485,000	[2] 8,100	[2][3][4] 1,237,700	[2][3][4] 785,800	[2][3][4][6] 513,600	[2][3][4] 6,318,600	[2][3][4][6] 3,763,000	[2][3][4] 11,324,700	[2][3][4][6] 3,431,600	[2][3][4] 15,967,700

HAILSTORM LOSSES

Table 14—Continued

Section	August Property	August Crops	September Property	September Crops	October Property	October Crops	November Property	November Crops	December Property	December Crops	Crop season April–Sept. Property	Crop season April–Sept. Crops	Total Property	Total Crops	Total Property and crops
Nevada											0	0	0	0	0
New Hampshire											[3][4] 2,000	[3][4] 5,000	[3][4] 2,000	[3][4] 5,000	[3][4] 7,000
New Jersey	(5)	(5)									(5)	(5)	(5)	(5)	(5)
New Mexico	5,000	5,000	1,000	5,000							[3] 257,000	[3] 417,500	[3] 257,000	[3] 417,500	[3] 674,500
New York		(1)	[2] 10,000								[2] 12,500	[2] 195,100	[2] 12,500	[2] 195,100	[2] 207,600
North Carolina	35,000	514,200									48,000	8,586,300	48,000	8,586,300	8,634,300
North Dakota	100,000	4,300,000	3,000	324,000	1,000	58,000					163,000	7,160,000	164,000	7,218,000	7,382,000
Ohio	50,000	50,000	(1)								[2][3][4][6] 1,680,000	50,000	[2][3][4][6] 1,680,000	50,000	[2][3][4] 1,730,000
Oklahoma											121,000	1,377,800	135,500	1,382,800	1,518,300
Oregon	[7] 3,000	[7] 4,500									[2][7] 3,000	[2][7] 20,000	[2][7] 3,000	[2][7] 20,000	[2][7] 23,000
Pennsylvania	(1)	[2][4] 5,000									(1)	[2][3][4] 21,000	(1)	[2][3][4] 21,000	[2][3][4] 21,000
Rhode Island	1,000	[3][4] 25,000									1,000	[3][4] 27,500	1,000	[3][4] 27,500	[3][4] 28,500
South Carolina		5,000									5,000	730,000	5,000	730,000	735,000
South Dakota		(1)									[2][3][6] 147,000	[2][3] 1,510,000	[2][3][6] 147,000	[2][3] 1,510,000	[2][3] 1,657,000
Tennessee	8,900	16,600									[2] 8,900	[2] 19,600	[2] 8,900	[2] 19,600	[2] 28,500
Texas						300					[2][4] 1,921,200	[2][4] 480,000	[2][4] 1,921,700	[2][4] 480,300	[2][4] 2,402,000
Utah							5,000	10,000					5,000	10,000	15,000
Vermont	1,000	[3][4] 20,000									[3][4] 27,000	[3][4] 205,000	[3][4] 27,000	[3][4] 205,000	[3][4] 232,000
Virginia	(1)	(1)									(1)	(1)	(1)	(1)	(1)
Washington	(5)		(5)								[2] 50,000	200,000	[2] 50,000	200,000	[2] 250,000
West Virginia	(1)	(5)									(1)	(5)	(1)	(5)	(1)
Wisconsin	[2] 75,000	[2] 205,000		(1)							[2] 166,000	[2] 380,000	[2] 166,000	[2] 380,000	[2] 546,000
Wyoming	2,500	13,000									12,000	230,000	12,000	230,000	242,000
Alaska											(1)		(1)		(1)
Hawaii											0	0	0	0	0
West Indies											0	0	0	0	0
Total	[2][4][6][7] 2,129,000	[2][3][4][7] 15,492,900	[2][3][4][6] 8,049,500	[2] 2,317,700	201,000	292,200	5,000	10,000	60,000	(5)	[2][3][4][6][7] 19,124,400	[2][3][4][7] 52,207,400	[2][3][4][6][7] 20,177,900	[2][3][4][7] 52,517,700	[2][3][4][7] 72,695,600

1. Losses occurred; amount not reported.
2. Additional losses occurred; no accurate estimate obtained.
3. Includes damage from attendant heavy rains.
4. Includes damage from attendant high winds.
5. Damage reported to be slight.
6. Includes crop damage.
7. Includes damage from attendant lightning.

Table 15

HAILSTORM LOSSES FOR PAST YEARS

Year	Property (exclusive of crops)	Crops	Total	Year	Property (exclusive of crops)	Crops	Total
1933			$6,773,800	1944	$9,061,000	$49,987,900	$59,048,900
1934			11,390,400	1945	3,608,200	31,513,400	35,121,600
1935			9,471,400	1946	9,783,800	30,382,000	40,165,800
1936	$1,953,900	$9,053,100	11,007,000	1947	3,829,300	54,348,900	58,178,200
1937	1,797,400	10,991,900	12,789,300	1948	12,163,200	56,180,800	68,344,000
1938	2,634,700	12,170,200	14,804,900	1949	6,336,400	41,646,600	47,983,000
1939	358,800	3,153,700	3,512,500	1950	21,072,800	28,094,500	49,167,300
1940	2,245,900	7,162,400	9,408,300	1951	26,416,400	49,015,800	75,432,200
1941	1,854,600	11,449,100	13,303,700	1952	9,454,400	40,094,300	49,548,700
1942	1,513,500	16,407,600	17,921,100	1953	11,457,800	38,330,900	49,788,700
1943	3,149,200	33,854,200	37,003,400	1954	20,177,900	52,517,700	72,695,600

WINDSTORM LOSSES

Table 16

(Windstorms other than tornadoes)

YEAR 1954

Section	January		February		March		April		May		June		July	
	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops
Alabama	30,000		1/ 12,500		33,300		1/ 25,800		12,000		1/ 17,800		1/ 214,000	500
Arizona							3,000	5,000	17,000		5,000		2/3/ 40,000	
Arkansas			1/ 8,000	(4)	(4)	(4)	1/ 56,300	1/5/ 2,000	(4)	(4)	5/ 58,100	1/5/ 5,000	5/ 86,700	
California					1/ 600,000								1/ 200,000	1/ 500
Colorado			235,000	10,000,000	63,500	5,000,000	1,500	(4)	2,000		50,000	200,000		
Connecticut					2,000						5/ 10,000		1/3/5/ 300,000	
Oelaware							(7)		(7)		(7)	(7)	(4)	(4)
Oistrict of Columbia							(7)		(7)		(7)	(7)	(4)	(4)
Florida			1/ 31,500	(4)			(4)	(4)	1/ 500		6/ 8,000	1/5/ 1,171,000	1/6/ 8,500	(4)
Georgia	9,000		1,000		29,200	(7)	1,200	(7)	400		13,200	800	11,600	200
Idaho	(4)		(4)								(4)	(4)	5/ 118,000	5/ 450,000
Illinois			22,000		1,005,000		55,000		5/ 20,000		1/3/5/ 5,506,500		1/3/ 155,000	
Indiana					40,000		22,800		71,500		358,800	100,000	157,300	9,100
Iowa							50,500	(4)	2/6/ 122,100		2/6/ 125,500	(4)	2/5/6/ 319.800	5/6/ 7,000
Kansas					38,600	1,000	73,800	5,000	26,100		126,300	15,000	8,600	
Kentucky			14,300		8,500		5/ 15,000		5,700		2/5/6/ 61,000	2/5/ 25,500	3/5/6/ 134,500	5/ 65,000
Louisiana			8,000				7,000	(7)	80,000	10,000	46,500	10,000	39,500	1/ 17,000
Maine											3/5/ 75,000		3/5/ 120,000	
Maryland							(7)		(7)		(7)	(7)	(4)	(4)
Massachusetts					10,000						3/5/ 50,000		3/5/ 197,000	
Michigan					(4)		1,010,000		1/ 55,000		1/ 60,000	(4)	1/ 250,000	(4)
Minnesota							1/ 25,000		62,000		2,160,000	(4)	32,000	1/ 8,000
Mississippi			40,000	3,000	500		75,000		146,000	225,000	35,000		160,000	(7)
Missouri	2,000				92,000		19,000		5,000		20,000		10,000	
Montana			94,000				3,000						5/ 64,000	5/ 121,000
Nebraska					800		27,000		4,000	6,000	31,000		65,000	(7)

See reference notes at end of table.

WINDSTORM LOSSES

Table 16 —Continued

(Windstorms other than tornadoes)

YEAR 1954

Section	August		September		October		November		December		Crop season April–Sept.		Total		
	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property and crops
Alabama	[1] 24,300		5,000						41,000	[1] 4,000	[1] 298,900	500	[1] 415,700	[1] 4,500	[1] 420,200
Arizona	57,000		1,000								[2,3] 123,000	5,000	[2,3] 123,000	5,000	[2] 128,000
Arkansas	[5,6] 77,000		[5] 11,000	(4)							[1,5,6] 289,100	[1,5] 7,000	[1,5,6] 297,100	[1,5] 7,000	[1,5,6] 304,100
California	[1] 500										[1] 200,500	[1] 500	[1] 800,500	[1] 500	[1] 801,000
Colorado	125,000	157,500					2,000		10,000	1,000,000	178,500	[1] 357,500	489,000	[1] 16,357,500	[1] 16,846,500
Connecticut	[2] 50,000,000	[1,5] 3,000,000	[1,2,3,5] 500,000		15,000						[1,2,3,5] 50,810,000	[1,5] 3,000,000	[1,2,3,5] 50,827,000	[1,5] 3,000,000	[1,2,5] 53,827,000
Delaware	(4)	(7)	(7)	(7)	(4)	(7)					(4)	(4)	(4)	(4)	(4)
District of Columbia	(4)	(7)	(7)	(7)	(4)	(7)					(4)	(4)	(4)	(4)	(4)
Florida	[1,6] 5,800	(7)					(4)				[1,6] 22,800	[1,5] 1,171,000	[1,6] 54,300	[1,5] 1,171,000	[1,5,6] 1,225,300
Georgia	25,500	300	2,000								53,900	[1] 1,300	93,100	[1] 1,300	[1] 94,400
Idaho			(7)		(4)	(4)					[1,5] 118,000	[1,5] 450,000	[1,5] 118,000	[1,5] 450,000	[1,5] 568,000
Illinois	[1,3] 1,900,000		15,000								[1,3,5] 7,651,500		[1,3,5] 8,678,500		[1,5] 8,678,500
Indiana	701,100	5,000	5,000		137,000						1,316,500	114,100	1,493,500	114,100	1,607,600
Iowa	[2,6] 59,000	[1,6] 2,500			20,000						[2,5,6] 676,900	[1,5,6] 9,500	[2,5,6] 696,900	[1,5,6] 9,500	[1,2,5,6] 706,400
Kansas	554,800	11,000	32,500		11,000	3,000					822,100	31,000	871,700	35,000	906,700
Kentucky	[3,5] 108,500	[5] 86,500	[2,3,5,6] 75,000						10,000	3,000	[2,3,5,6] 399,700	[2,5] 177,000	[2,3,5,6] 432,500	[2,5] 180,000	[2,5,6] 612,500
Louisiana	52,500	(7)	1,000	(7)							226,500	37,000	234,500	37,000	271,500
Maine	[1,2] 5,000,000	[1,5] 10,000,000	[2,3,5] 25,000,000								[1,2,3,5] 30,195,000	[1,5] 10,000,000	[1,2,3,5] 30,195,000	[1,5] 10,000,000	[1,2,5] 40,195,000
Maryland	(4)	(7)	(7)	(7)	37,500,000	(7)					(4)	(4)	[1] 37,500,000	(4)	[1] 37,500,000
Massachusetts	[2] 175,000,000	[5] 5,000,000	[2,3,5] 7,500,000		15,000						[2,3,5] 182,747,000	[5] 5,000,000	[2,3,5] 182,772,000	[5] 5,000,000	[2,5] 187,772,000
Michigan			115,000	(4)							[1] 1,490,000	(4)	[1] 1,490,000	(4)	[1] 1,490,000
Minnesota	[2] 64,000	(4)					10,000				[1,2] 2,343,000	[1] 8,000	[1,2] 2,353,000	[1] 8,000	[1,2] 2,361,000
Mississippi											416,000	[1] 225,000	456,500	[1] 228,000	[1] 684,500
Missouri			[2] 570,000								[2] 624,000		[2] 718,000		[2] 718,000
Montana	[1] 3,500	14,000									[1,5] 70,500	[5] 135,000	[1,5] 164,500	[5] 135,000	[1,5] 299,500
Nebraska	16,900										143,[illegible]00	[1] 6,000	144,700	[1] 6,000	[1] 150,700

WINDSTORM LOSSES

Table 16 -Continued

(Windstorms other than tornadoes)

Section	January		February		March		April		May		June		July	
	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops
Nevada	100,000													
New Hampshire											[3,5] 50,000		[3,5] 65,000	
New Jersey	15,000		15,000		15,000		20,000		15,000		10,000		15,000	
New Mexico			(4)	(4)	2,500	(4)					3,000			
New York					[1,8] 25,000						[1,2,3,5,6] 1,242,500	(7)	[1] 2,200,000	[1] 29,000
North Carolina	25,500								650,000		10,000		360,000	50,000
North Dakota							4,500				[1] 1,000,000	[2] 1,000,000	55,000	
Ohio					[2,3] 100,000		[2] 15,000		500		[2,3,6] 160,000		[2,3,6] 1,100,000	
Oklahoma			(4)	(4)	211,000		64,400	3,600	107,000		69,000	20,000	32,500	
Oregon	[2,8] 330,000	[2,8] 5,000											[2] 15,000	[2] 10,000
Pennsylvania	(4)		(4)		[1] 100,000	(4)	(4)	(4)	(7)		[1] 150,000	(4)	[2,6] 10,000,000	[1,2] 200,000
Rhode Island					1,500						(4)		[3,5] 60,000	
South Carolina			3,000		112,000		4,000	1,000			11,500		200,000	230,000
South Dakota					[8] 100,000						[1,2,5] 225,000	(4)	[1,5] 10,000	(4)
Tennessee			7,000								122,000	60,000	18,000	
Texas			[1,6] 18,300	1,000	[1,5] 360,500	2,000	[1,5,6] 2,164,500		[1,5] 17,000		[1,5] 761,000	[1,5] 6,000	[1,5] 531,100	[1,5] 500
Utah									8,000					
Vermont					4,000						[3,5,6] 45,000		[3,5] 60,000	
Virginia					(7)		(7)		(7)		(7)	(7)	(4)	(4)
Washington	50,000										11,000	(7)	2,000	(7)
West Virginia											(4)	(4)	(4)	(4)
Wisconsin					[1,6,8] 250,000		[1,6] 125,500	(4)	[1,2,6] 61,000		[1,2,6] 742,000	[1,2,6] 1,200	[1,2,6] 1,202,500	[1,2] 636,000
Wyoming			(7)	(7)	1,000		100						[6] 5,000	
Alaska	178,000				500									
Hawaii	[1] 1,000				[1] 12,000									
West Indies														
Total	[1,2,8] 740,500	[2,8] 5,000	[1,6] 509,600	[1] 10,004,000	[1,2,3,5,6,8] 3,218,400	[1] 5,003,000	[1,2,5,6] 3,868,900	[1,5] 16,600	[1,2,5,6] 1,487,800	[1] 241,000	[1,2,3,5,6] 13,429,700	[1,2,5,6] 2,614,500	[1,2,3,5,6] 18,629,600	[1,2,5,6] 1,833,800

See reference notes at end of table.

WINDSTORM LOSSES

Table 16 --Continued

(Windstorms other than tornadoes)

YEAR 1954

Section	August		September		October		November		December		Crop season April-Sept.		Total		
	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property and crops
Nevada													100,000		100,000
New Hampshire	1/2/ 3,000,000	1/5/ 2,000,000	2/3/5/ 5,500,000								1/2/3/5/ 8,615,000	1/5/ 2,000,000	1/2/3/5/ 8,615,000	1/5/ 2,000,000	1/2/5/ 10,615,000
New Jersey	250,000	10,000	100,000	10,000	7,500,000	2,500,000	25,000		25,000		410,000	20,000	8,005,000	2,520,000	10,525,000
New Mexico	27,800										30,800		1/ 33,300	(4)	1/ 33,300
New York	1/ 5,040,000	1/5/ 515,000	1/6/ 519,000	1/5/ 2,196,500	2/ 3,000,000						1/2/3/5/6/ 9,001,500	1/5/ 2,740,500	1/2/3/5/6/8/ 12,026,500	1/5/ 2,740,500	1/2/5/6/8/ 14,767,000
North Carolina	185,000	125,000	126,500	50,000	100,000,000	1,000,000					1,331,500	225,000	101,357,000	1,225,000	102,582,000
North Oakota											1/ 1,059,500	2/ 1,000,000	1/ 1,059,500	2/ 1,000,000	1/2/ 2,059,500
Ohio	2/3/6/ 500,000		2/3/5/6/ 1,100,000								2/3/5/6/ 2,875,500		2/3/5/6/ 2,975,500		2/5/6/ 2,975,500
Oklahoma	221,500		47,000	2,000							548,400	25,600	1/ 759,400	1/ 25,600	1/ 785,000
Oregon											2/ 15,000	2/ 10,000	2/8/ 345,000	2/8/ 15,000	2/8/ 360,000
Pennsylvania	1/ 30,000	(4)	(4)	(7)	3/ 20,000,000						1/2/6/ 10,180,000	1/2/ 200,000	1/2/3/6/ 30,280,000	1/2/ 200,000	1/2/6/ 30,480,000
Rhode Island	2/ 200,000,000	5/ 1,000,000	2/3/5/ 2,000,000								1/2/3/5/ 202,060,000	5/ 1,000,000	1/2/3/5/ 202,061,500	5/ 1,000,000	1/2/5/ 203,061,500
South Carolina	69,000	21,000			23,000,000	2,000,000					284,500	252,000	23,399,500	2,252,000	25,651,500
South Dakota	(4)										1/2/5/ 235,000	(4)	1/2/5/8/ 335,000	(4)	1/2/5/8/ 335,000
Tennessee	37,000	7,000									177,000	67,000	184,000	67,000	251,000
Texas	1/ 104,500	1/ 1,300			10,500						1/5/6/ 3,578,100	1/5/ 7,800	1/5/6/ 3,967,400	1/5/ 10,800	1/5/6/ 3,978,200
Utah			3,000								11,000		11,000		11,000
Vermont	2/ 300,000	1/5/ 250,000	1/2/3/5/ 100,000		5,000						1/2/3/5/6/ 505,000	1/5/ 250,000	1/2/3/5/6/ 514,000	1/5/ 250,000	1/2/5/6/ 764,000
Virginia	(4)	(4)	(7)	(7)	15,000,000	(7)					(4)	(4)	1/ 15,000,000	(4)	1/ 15,000,000
Washington									25,000		13,000	(7)	88,000	(7)	1/ 88,000
West Virginia	(4)	(7)	(7)	(7)	76,000	75,000					(4)	(4)	1/ 76,000	1/ 75,000	1/ 151,000
Wisconsin	1/6/ 108,500	1/ 60,000	(4)	(4)	1/2/ 15,000				(4)		1/2/6/ 2,239,500	1/2/6/ 697,200	1/2/6/8/ 2,504,500	1/2/6/ 697,200	1/2/6/8/ 3,201,700
Wyoming			200								6/ 5,300		1/6/ 6,300	(7)	1/6/ 6,300
Alaska					30,000				2,000				210,500		210,500
Hawaii							(4)	(4)	(4)				1/ 13,000	(4)	1/ 13,000
West Indies											0	0	0	0	0
Total	1/2/3/5/6/ 443,648,700	1/5/6/ 22,266,100	1/2/3/5/6/ 43,328,200	1/5/ 2,258,500	1/2/3/ 206,334,500	1/ 5,578,000	1/ 37,000	(4)	1/ 113,000	1/ 1,007,000	1/2/3/5/6/ 524,392,900	1/2/5/6/ 29,230,500	1/2/3/5/6/8/ 735,345,900	1/2/5/6/8/ 50,827,500	1/2/5/6/8/ 786,173,400

1. Additional losses occurred.
2. Includes damage from attendant heavy rains.
3. Includes crop damage.
4. Losses occurred; amount not reported.
5. Includes damage from attendant hail.
6. Includes damage by lightning.
7. Damage reported to be slight.
8. Includes damage from attendant heavy snow.

WINDSTORM LOSSES PAST YEARS

Table 17

(Windstorms other than tornadoes)

Year	Total loss of life	Total property loss	Year	Total loss of life	Total property loss
1916	65	$11,712,100	1937	43	$6,292,900
1917	25	1,400,600	1938	630	315,435,400
1918	79	7,602,200	1939	60	3,988,100
1919	344	28,170,800	1940	251	25,588,900
1920	42	4,735,400	1941	43	15,523,300
1921	65	13,174,700	1942	68	32,691,600
1922	133	5,055,800	1943	61	25,056,500
1923	68	5,261,800	1944	448	207,745,900
1924	78	13,545,800	1945	85	36,498,700
1925	88	11,612,400	1946	70	29,515,200
1926	357	93,610,300	1947	117	135,377,500
1927	64	6,783,200	1948	52	59,169,900
1928	1,947	88,836,000	1949	102	69,476,600
1929	46	20,334,600	1950	210	134,798,800
1930	49	5,705,500	1951	289	86,296,600
1931	17	7,773,000	1952	137	78,484,000
1932	306	42,657,400	1953	118	151,958,400
1933	156	65,604,100	1954	292	786,173,400
1934	109	19,497,200			
1935	461	17,191,000	Total	7,696	
1936	121	17,256,300			

NORTH ATLANTIC HURRICANES AND TROPICAL DISTURBANCES—1954

Compiled by C. E. Rhodes
U. S. Weather Bureau, Washington, D. C.

From the standpoint of property damage the hurricane season of 1954 was the most destructive of record. Damage estimates total approximately $857,015,000, of which $755,472,500 was in the United States, $100,000,000 in Canada, $1,500,000 in Mexico, and $42,500 in the Grenadine Islands, a short distance north of Trinidad. Additional extensive damage, for which accurate estimates are not available, occurred on the Island of Haiti. "Carol" alone did more damage than any single storm or natural catastrophe on record for the United States and more than that resulting from any previous entire hurricane season. Fatalities attributed to hurricanes of the 1954 season were 193 deaths in the United States, 78 in Canada, 43 in Mexico, 6 in the Bahamas, 400 to 1000 in Haiti, and 29 in Nicaragua. Fatalities in individual historical storms such as the South Atlantic Coast storm of August 1893 (2,000 dead), the Louisiana-Mississippi hurricane of October 1893 (1,800 dead), the Palm Beach hurricane of September 1928 (1,836 dead), and the Galveston hurricane of September 1900 (total loss of 6,000 lives) have far exceeded the deaths of the entire 1954 season, but never before have the storms of a season produced so great an amount of property damage.

Eight tropical storms occurred during the 1954 season, which is near the average of 9.2 per season. Five were of known hurricane intensity, one (Florence) possibly reached hurricane intensity as it passed inland on the Mexican coast, while two (Barbara and Gilda) were below hurricane force and of short duration. Five of the storms reached the United States, four crossing its coast line and one reaching Texas after passing inland on the Mexican coast. All four that crossed the United States coast line were of hurricane force.

Unusual features of this season were the absence of tropical storms in Mississippi, Alabama, Georgia, and Florida and the passage of three severe hurricanes through the Northeastern States. The occurrence of two hurricanes in New England in one year is remarkable, the average for that area being less than 10 per century.

Carol was the third storm of the season as well as the third great New England hurricane of recent years, following as she did the hurricanes of September 17-21, 1938 and September 8-16, 1944. These three storms call attention to earlier New England hurricanes which occurred August 15, 1635; August 19, 1788; September 22-23, 1815; September 3, 1821; September 8, 1869; October 23-24, 1878; and August 24, 1893. Accounts of most of these early New England storms can be found in "Historic Storms of New England" by Sidney Perley, the Salem Press, 1891, while the storms of 1938 and 1944 are described in "Hurricanes" by I. R. Tannehill, Princeton University Press, 1952.

Carol August 26-31, and Edna September 6-11, 1954 followed courses rather similar to those of the 1938 and 1944 storms as far north as northern Massachusetts except that Edna passed farther to the east. Until the occurrence of Carol the 1938 New England hurricane was recognized as the most destructive tropical storm to reach the coast of the United States. Damage from that storm amounted to $300,000,000, while Carol destroyed $461,027,500 worth of property. The 1944 storm caused damage amounting to $100,000,000 and Edna (1954) caused damage amounting to $42,815,000. The last hurricane of 1954, Hazel also affected New England, but damage from this storm in that area was minor.

Comparing the three major hurricanes of this season: Edna was not as destructive as Carol, principally because Edna did not occur at the time of high tides in areas most directly affected. The time of the onshore highest winds and the time of high tide coincided in hurricane Carol but tended to counteract each other in hurricane Edna. Damage in the United States from Hazel amounted to $251,630,000, which is $209,397,500 less than that from Carol. Hurricane Hazel travelled over land for a greater distance than did Carol but the areas through which she passed were not as densely populated or as heavily industrialized as those traversed by Carol and the property damage did not have as great a dollar value. However, additional damage from Hazel for which figures are not available, particularly in Virginia and New York, would run into millions of dollars. Destruction in certain beach areas of North Carolina and South Carolina was more complete, however, than in any area affected by Carol. The residents of some areas in North Carolina termed this storm the greatest natural catastrophe ever to strike the State.

The following are individual reviews of all North Atlantic hurricanes and tropical disturbances that occurred during the 1954 season. All times mentioned are in Eastern Standard (G.C.T. minus 5 hours). A synopsis of the important features of these storms is given in Table 18a; their tracks are shown by a chart at the end of this bulletin.

ALICE - June 24-26.--The first storm of the season developed rapidly in the west Gulf of Mexico on the 24th of June. It had intensified to hurricane force early on the 25th, as indicated by reports of 75 to 80 m.p.h. winds from the trawler Spar. It moved inland 65 miles south of Brownsville early on the morning of the 25th. When it reached a position southwest of Brownsville, the early morning winds aloft report showed southeast winds of 150 m.p.h. at 3,000 feet. Only one report indicating winds of hurricane force was received from a coastal or inland station. A fishing camp along the Mexican coast about 100 miles south of Brownsville reported 70- to 80-m.p.h. winds at 10 a.m., c.s.t., on the 25th. Highest wind in Texas was 61 m.p.h. in gusts at Brownsville on the 25th.

The storm moved up the Rio Grande Valley and passed over Laredo, Texas, late on the 25th, and Del Rio about midday on the 26th. A cyclonic circulation aloft continued over southwest Texas until the end of June, causing heavy rains and floods. There was very little damage by winds and tides associated with this storm. The major damage and casualties resulted from floods caused by heavy rains. There was considerable damage to crops, particularly to cotton. Seventeen deaths were reported in Texas and an estimated 38 in Mexico.

BARBARA - July 28-29.--This storm was first detected near latitude 28.5° N., longitude 91.5° W., or 150 miles southwest of New Orleans, at 1:20 p.m., c.s.t., on the 28th. It moved north-northwestward and went inland between Vermilion Bay and Cameron, La., on the early morning of the 29th, and at 7 a.m., c.s.t., was centered about 20 miles southeast of Lake Charles. It was then moving north-northwestward about 5 m.p.h. and decreasing in intensity. Highest wind reported was 60 m.p.h. from the Henry M. Dawes south of Morgan City, La., on the late afternoon of the

28th. Several places from the Vermilion Bay area westward to north of Houston, Texas, reported rainfall in excess of 10 inches. A 24-hour rainfall of 11.55 inches was reported from Franklin in the south-central part of Louisiana. Some damage to crops such as rice and corn was reported but the rains associated with the storm were considered more beneficial than damaging. Damage caused by winds was negligible. Heavy to excessive rains fell in the eastern portion of the upper coast of Texas also, with the center of heaviest rainfall slightly northwest of Houston. Considerable damage to residential property in northwest Houston resulted on the 30th and 31st from slow drainage into bayous in the area.

CAROL - August 26-31.--First detected as a weak easterly wave which was tracked from a point to the east of the Leeward Islands as it moved westward for several days, Carol developed a definite storm center east of the northern portion of the Bahama Islands on the 26th to 27th of August. From there it moved to a position near 30° N., 76°W., where it came to a near standstill. Hurricane force winds were first reported during the morning of the 27th. On the 29th, still moving sluggishly, Carol changed direction to northwestward. This change in course at first posed a threat to the South Carolina shore. Within 24 hours movement changed to a more northerly direction. At 5 a.m. of the 30th, the hurricane was centered near latitude 32° N., longitude 78° W., or about 150 miles east-southeast of Charleston, S. C. By noon the center was about 100 miles south-southeast of Wilmington, N. C., moving north-northeastward. At 1 p.m. of the 30th the storm was still moving very slowly north-northeastward but increasing in intensity. Winds near the center were reported to be over 100 m.p.h., while winds of hurricane force extended over 100 miles to the east of the center and 50 to 60 miles to the west. The U.S.A. Tanker S.S. Saconnet was in the "eye" of the hurricane near 33.5° N., 77.3° W., between 2:30 and 3:30 p.m. on the 30th, and experienced winds of 90 knots at 3 p.m., at which time the wind shifted from SE. to N. Waves were over 30 feet high an hour before the ship entered the "eye". From midafternoon of the 30th to past midnight the western side of Carol lashed the shore of North Carolina from Wilmington to Cape Hatteras. Strong winds tore down power and telephone lines, and the Trent and Neuse Rivers, their levels raised by the storm tide, flooded the water front of New Bern. Peak gusts of 90 to 100 m.p.h. were reported from Hatteras, 65 m.p.h. from Cherry Point, and 55 m.p.h. from Wilmington.

Late on the 30th, the hurricane's center passed a few miles east of Cape Hatteras. At 11 p.m. the center was near latitude 36° N., longitude 75° W., or about 100 miles south-southeast of Norfolk, Va. The size of the storm and the strength of the winds remained about the same, but a rapid and sharp increase occurred in the rate of forward motion as it passed north-northeastward along the middle Atlantic coast during the early morning of the 31st. The forward speed, accelerated to 40 m.p.h., brought the center over extreme eastern Long Island by 9 a.m.

From the Virginia shore area to Long Island the track of the center of the hurricane was 75 to 100 miles east of the mainland, so that dangerous winds did not reach westward as far as the coast. Waves were high, however, and boardwalks and similar beach installations were damaged, particularly in New Jersey, while numerous small pleasure and fishing craft dragged their moorings or broke loose altogether. In Virginia, Maryland, and Delaware damage was minor.

The center of the hurricane crossed the south shore of Long Island slightly east of West Hampton about 8:30 a.m. An hour later it passed into Long Island Sound off Cutchogue. By 10:30 a.m. it was over the southeast shore of Connecticut near the mouth of the Connecticut River. Curving slightly on a northward course, the center passed 5 to 10 miles west of Worcester, Mass., about noon and penetrated into south-central New Hampshire about 1:30 p.m. As the center of the storm traveled northward over the rugged terrain of New Hampshire the strength of its winds and the speed of forward progress diminished. At 7:30 p.m., the center was located at latitude 46° N., longitude 71° W., just north of the Canadian border, and the weakening storm had lost all hurricane force.

In the Long Island-New England area the wind damage was most severe over the region east of the hurricane's center line of passage and south of the northern border of Massachusetts. This region included Long Island east of Riverhead; New London, Tolland, and Windham Counties in extreme eastern Connecticut; all of Rhode Island; and Massachusetts east of the Webster-Worcester-Fitchburg line out to the "elbow" of Cape Cod. This area was swept during the morning by sustained winds of hurricane force with gusts up to 125 m.p.h. Countless trees were toppled, blocking roads, smashing buildings and automobiles, and wrecking electric and telephone lines. Enormous destruction was done to roofs, chimneys, steeples, aerials, signs, windows, store fronts, and radio and TV towers. All forms of transportation were crippled. Hundreds of thousands of families had to do without telephone service and without electricity for cooking and lighting for days.

Similar but lesser devastation took place during the morning over central Long Island and the strip of Massachusetts and Connecticut extending from the hurricane's center line to the Connecticut Valley. This district was lashed by 45- to 55-m.p.h. sustained winds, with gusts to 65 m.p.h., and by even higher winds close to the center of the storm. In the afternoon these winds pummeled the southwestern corner of New Hampshire and the portion of the State east of the storm's center line and south of Lake Winnipesaukee, and southwestern and south-central Maine. Along the New Hampshire and Maine coasts to the Kennebec River winds were higher than over the rest of northern New England; sustained speeds were in the 60- to 70-m.p.h. class and gusts ranged to 80 m.p.h. Vermont, central and northern New Hampshire, most of Maine, and the western parts of Massachusetts and Connecticut experienced gale force winds, but no really severe velocities, and the same conditions were encountered over eastern New York State, including the western end of Long Island.

The hurricane struck Long Island and southern New England close to the time of high tides; this circumstance meant that the wind driven water, topped by heavy waves, flooded harbors, beaches, and similar low-lying areas producing extensive wreckage. Seaside resorts, thronged by thousands of vacationists, were areas of particularly heavy damage. An estimated 3,000 small craft were seriously damaged or destroyed by the combined action of wind and water.

The heaviest crop damage occurred in Rhode Island, eastern Massachusetts, southeastern New Hampshire, and southern and central Maine. The hardest hit crop in New England was the apple crop, about 40 percent of which was blown down. Substantial damage to silage corn, sweet corn, peaches, and tomatoes also occurred; damage to tobacco and cranberries was minor. In Long Island very heavy fruit losses took place in Suffolk County, with substantial damage to cauliflower, corn, potatoes, and lima beans; by comparison, crop damage in Nassau and Westchester Counties was quite light.

Casualties caused by hurricane Carol were light as compared to the amount of damage. There were approximately 60 deaths in the Long Island-New England area and about 1,000 persons suffered major and minor injuries. Damage figures by States are listed below:

	Property	Crops	Total
North Carolina	$227,500	-	$227,500
New Jersey	250,000	-	250,000
New York	5,000,000	$1,000,000	6,000,000
Connecticut	50,000,000	3,000,000	53,000,000
Rhode Island	200,000,000	1,000,000	201,000,000
Massachusetts	175,000,000	5,000,000	180,000,000
New Hampshire	3,000,000	2,000,000	5,000,000
Maine	5,000,000	10,000,000	15,000,000
Vermont	300,000	250,000	550,000
Totals	438,777,500	22,250,000	461,027,500

A tabular listing of meteorological data associated with this hurricane is contained in Table 18.

DOLLY - September 1-2.--This was a small hurricane that formed in the apex of an easterly wave near 26° N., 69° W. during the night of August 31 - September 1, and by 7:30 a.m. of the 1st was near 29° N., 70° W. It moved very rapidly northward and then northeastward, and by afternoon of September 2 was east of Nova Scotia, reduced in force and becoming extra-tropical. Strongest winds reported by aircraft were around 100 to 115 m.p.h. on the afternoon of September 1, and thereafter there was a gradual loss in force. This hurricane remained at sea and no damage was reported.

EDNA - September 6-11.--An easterly wave developed into a tropical storm on the afternoon of September 6 near 22° N., 70° W., or about 60 miles east of Turks Island, and increased to hurricane strength during the night. On the 7th and 8th it swept the outer Bahama Islands as it moved on a broad curving path to northward. The center passed very close to San Salvador Island late on the 7th where winds were up to hurricane force in gusts, but no appreciable damage resulted. High seas and gale winds were experienced on the other outer fringe islands northward to Great Abaco. During the 9th and 10th the hurricane moved northward very near 76° W. longitude and gradually turned to north-northeast. It passed just east of Cape Hatteras early on the night of the 10th and winds of about 75 m.p.h. occurred on the North Carolina Capes from Cape Lookout to Manteo. Thereafter it moved rapidly northeastward and passed nearly over Cape Cod on the 11th, and thence into eastern Maine, Nova Scotia, and New Brunswick during the night.

Strongest winds estimated by aircraft were from 115 to 120 m.p.h. until the storm passed east of Hatteras on the 10th. The hurricane was centered about 100 miles south-southwest of Nantucket Island at 11:00 a.m. of the 11th. Highest winds were estimated by aircraft up to 135 m.p.h. over a small area near the center. The storm crossed Cape Cod and moved over Massachusetts Bay at 1:45 p.m. Winds near the center were estimated at 110 to 135 m.p.h. When the center was about 80 miles southeast of Portland, winds were still estimated to be up to 120 m.p.h. Highest winds at land stations were 88 m.p.h. in gusts at Nantucket, 101 m.p.h. at Blue Hill, 87 m.p.h. at Logan Airport, Boston, and 110 m.p.h. at Block Island, R. I. Extremely heavy rainfall accompanied the hurricane with amounts of 5½ inches at Boston and over 7 inches at Portland. The American S. S. Fairland reported 120-knot winds and a barometer reading of 28.79 inches just before she passed through the "eye" of the storm between 10 a.m. and 1 p.m. on the 8th. The position of the ship at the time was 26.5° N. latitude and 75.5° W. longitude.

At 11 p.m. of the 11th the storm was centered about 60 miles north of St. Johns, New Brunswick. It was slowly losing its tropical characteristics and winds were diminishing near the center. Highest winds were then 100 m.p.h.

There was no loss of life and only minor damage in North Carolina. Twenty one deaths resulted from the hurricane in New Jersey and New England. The amount of damage by States is listed below:

	Property	Crops	Total
Maine	$25,000,000	-	$25,000,000
New Hampshire	5,500,000	-	5,500,000
Vermont	100,000	-	100,000
Massachusetts	7,500,000	-	7,500,000
Rhode Island	2,000,000	-	2,000,000
Connecticut	500,000	-	500,000
New York	500,000	$1,500,000	2,000,000
New Jersey	100,000	-	100,000
North Carolina	75,000	40,000	115,000
Totals	41,275,000	1,540,000	42,815,000

A tabular listing of meteorological data associated with this storm is contained in Table 18.

FLORENCE - September 11-12.--This storm formed in the southwestern Gulf of Mexico and moved over the Mexican coast between Tuxpan and Nautla on the morning of the 12th. The highest wind reported by reconnaissance aircraft was about 65 m.p.h. The storm possibly reached hurricane intensity about the time it passed inland. The press reported 5 dead and more than $1,500,000 damage around the oil center of Poza Rica, Mexico, on the Gulf Coast. The five who perished reportedly fell into flooded ravines or were swept away by torrents rushing through the streets.

GILDA - September 25-27.--This storm formed in the Caribbean Sea east of Cape Gracias, Nicaragua, on September 25 and moved westward along the north coast of Honduras and into British Honduras near Stann Creek, about 60 or 70 miles south of Belize, around 3:30 p.m. of the 27th. The storm was of less than hurricane force throughout its life, with highest winds of 60 to 70 m.p.h. in squalls. Damage was slight to buildings and there were no casualties as a direct result of the storm. Rainfall was very heavy in northern Honduras, resulting in disastrous floods especially around San Pedro Sula, La Lima, and the adjacent valley areas. Press reports indicated 29 dead and thousands homeless and marooned in the flooded area, and extensive damage to property and crops.

HAZEL - October 5-16.--The possible development of a tropical storm a short distance south of Barbados was first indicated on the morning of October 5, following the passage of a strong easterly wave into the area. Late that afternoon a naval reconnaissance aircraft from San Juan located the small but intense center of hurricane Hazel about 50 miles east of Grenada, accompanied by winds of about 95 m.p.h. near the center. The center of the storm passed between the islands of Grenada and Carriacou during the evening of the 5th. All of the Grenadine Islands except Carriacou escaped with only minor damage and no loss of life. Total losses on this island were estimated at $35,000 to property, $5,000 to crops, and $2,500 to livestock.

After passing the Grenadine Islands, this hurricane continued on a west-northwestward course, briefly threatened the Netherlands West Indies during the night and early morning of October 6-7, and recurved toward the north-northeast on the 11th. The center passed over the western tip of the south peninsula of Haiti during the early morning of October 12, and crossed the northwest peninsula that evening. The western portions of both Haitian peninsulas were devastated by the hurricane. Several towns were almost totally demolished, including Dame Marie, Anse d' Hainault, Mole St. Nicolas, and Jean Rabel. The larger cities of Jeremie, Les Cayes, and Port de Paix suffered severe damage from hurricane winds. High tides on the south coast from Les Cayes westward added to the destruction. Torrential rains fell over most of Haiti, flooding rivers, washing out roads, and destroying property, livestock, and crops. A landslide caused by heavy rains a few days after the hurricane buried the mountain village of Berley a short distance southwest of Port-au-Prince. Only 2 of Berley's 260 inhabitants escaped unhurt.

Estimates of total damage in Haiti are not available. The number of deaths were estimated between 400 and 1,000, including 200 or more buried in the landslide.

Extreme winds of 125 m.p.h. at several places in the western part of the southern peninsula were reported by the Corps d' Aviation, Bowen Field, Port-au-Prince, Haiti. Estimates from aircraft reconnaissance ranged from 95 to 135 m.p.h. as the storm passed over the western peninsulas of Haiti.

After passing through the Windward Channel the hurricane moved northward and passed directly over the Island of Great Inagua and between Mayaguana and Acklin Islands, and passed a short distance east of the remainder of the Bahamas. A minimum pressure of 29.34 inches and a maximum wind of only 40 m.p.h. were reported at Great Inagua Island. The low wind speed was thought to be due to distortion of the hurricane in its passage through the mountainous terrain bordering the Windward Channel.

Damage was minor in the Bahamas. Six lives were lost out of a total of 15 aboard a sailboat that capsized when it was trying to take shelter at Inagua.

During the 14th and 15th, until it reached the South Carolina coastal area, the hurricane moved north-northwestward and highest winds were estimated in all warning messages in excess of 100 m.p.h. The center passed between 90 and 100 miles east of Charleston, S. C., about 8 a.m. on the 15th and first touched the United States coast at North Island, S. C. Then, closely following the coast line, the center gradually worked inland with some portion of the "eye" being over the entire length of the coastal area as far as Little River Inlet. The center passed inland a few miles northeast of Myrtle Beach between 9:30 and 10:00 a.m.

Mountainous seas and 100-m.p.h. winds battered the northeast coast and excessive rains fell in the eastern portion of the State. Much of the loss in South Carolina resulted from high water, since the storm struck at the time of high tide. Wave damage was particularly great. Wind estimates were 130 m.p.h. at Windy Hill and varied from 130 to 150 m.p.h. at several points between Myrtle Beach and Cape Fear. Estimated speeds of 127 m.p.h. occurred along the coast at Myrtle Beach, although the highest measured speed a short distance west of the beach was 106 m.p.h.

This hurricane caused one death in South Carolina, while damages to property were estimated at $25,000,000 and to crops at $2,000,000. The major portion of the damage occurred in Georgetown and Horry Counties where wind and high tide combined to wreck hundreds of homes and cottages in towns and beach communities from Georgetown northeastward. Wave damage was particularly great. Buildings and other structures crashed as the waves began rolling at mid-morning. As the area of highest wind moved from the beaches, fragile houses were knocked apart or were floated to sea and broken to pieces by the waves.

Reaching its height at about 9 a.m. the storm was reported to have demolished 40 or more homes and damaged many more at Pawley's Island. Approximately 700 feet of the 800-foot pier at Pawley's Island was swept away. On the south end of the beach a large number of recently built homes were completely destroyed. From Pawley's Island to the North Carolina border the ocean front was almost completely devastated by wind-driven tides. Damage was heavy as far south as Georgetown and mostly minor south of that point.

Garden City and Surfside to the south of Myrtle Beach and beaches from Windy Hill to East Cherry Grove on the north were hardest hit by the fury of the hurricane. In those areas sand covered lots where front row houses stood. Second row dwellings were washed from their foundations. Those left standing were declared structurally unsound.

At Garden City a two-story concrete block store was mute evidence of the terrific fury of the hurricane. The store was a large one, probably 40 feet wide and 80 feet long. The lower floor simply disintegrated and the upper story, almost intact, was hurled over 150 yards west into the inlet between Garden City and the mainland. Witnesses reported that the business district at Garden City was "just a pile of rubbish". Only three of the 275 houses at Garden City remained habitable.

The storm began affecting the Myrtle Beach area between 6 and 7 a.m. with strong winds from the northeast and north-northeast. The "eye" passed across the city at 9:23 a.m. It was estimated at approximately 12 miles in diameter and was observed from 9:20 to 9:45 a.m., during which time the tide was reversed and turned to the sea. The time of greatest wind damage was during the period 6:40 to 8:45 a.m., when winds from the north-northeast ranged up to 95 m.p.h. The greatest damage along the ocean front was done by waves, some of which crested at more than 30 feet above mean low water. Winds were 98 m.p.h. in gusts (measured) from the north-northeast at 9:15 a.m. and 106 m.p.h. in gusts from the southwest at 10 a.m. Maximum winds of 106 m.p.h. were observed several times during the second phase of the hurricane. As the "eye" passed the wind ceased from north-northeast and suddenly came first slightly from north of west and then in full force from south-southwest.

Windy Hill reported 50 percent of all property damaged. At East Cherry Grove Beach 75 dwellings were reported destroyed or badly damaged. A two-story house washed to sea at East Cherry Grove Beach, and at Ocean Drive Beach the three-story McArthur Hotel was blown into the sea. At least 195 homes in the first two rows along the beach at Ocean Drive were destroyed. Splintered timbers and concrete slabs were all that was left along the beach front. At least 50 percent of the buildings in the third row were heavily damaged. Only two of Crescent Beach's 529 homes were still standing and only three of Garden City's 275 houses were habitable. At Cherry Grove 200 houses were destroyed and 200 more were damaged. The entire frontage and second row of houses were destroyed.

The following tide heights during the storm were reported by the Weather Bureau Office at Charleston:

Georgetown Light	8.1	feet	above	mean	low	water
Pawley's Inlet	13.6	"	"	"	"	"
Myrtle Beach State Park	15.5	"	"	"	"	"
Myrtle Beach, Spivey's Swash (City)	16.9	"	"	"	"	"
Windy Hill	14.3	"	"	"	"	"
Little River	15.3	"	"	"	"	"
Murrell's Inlet	13.3	"	"	"	"	"

(Information obtained with the assistance of the U.S. Engineers)

Property damage in the area of major destruction was itemized by localities as follows: Georgetown, $500,000; Pawley's Island, $1,000,000; McKenzie Beach, $200,000; Garden City, $2,750,000; Surfside, $600,000; Myrtle Beach, $5,000,000; Windy Hill, $2,000,000; Atlantic Beach, $400,000; Crescent Beach, $3,500,000; Ocean Drive Beach and Tilghman's Beach, $500,000; Cherry Grove, $1,750,000; and Little River, $100,000.

After moving inland the hurricane continued northward through North Carolina on a slightly curved path that took the center over Shalotte and Bolton and slightly east of Whiteville and Clinton, west of Goldsboro, Wilson and Nashville, and across the state line near Warren County. "Eye" characteristics were reported from points 10 to 15 miles on either side of the path.

All reports in North Carolina indicated a definite storm wave. The time of highest water came during or shortly after the lowest pressure and maximum winds. Hurricane force winds prevailed along the coast from near Charleston, S. C., to Cape Hatteras. Winds reached 98 m.p.h. in gusts at Wilmington, N. C., and were estimated at 125 m.p.h. at Wrightsville Beach, 140 m.p.h. at Oak Island, and 150 m.p.h. at Little River, Calabash and Holden Beach. Grannis Airport, Fayetteville, reported gusts up to 110 m.p.h.

Destruction to beach communities in North Carolina extended over 100 miles along the coast. Property loss was estimated at $36,000,000 in the beach area. Wind-driven tides devastated the immediate ocean front from the South Carolina line to Cape Fear, N. C. The Meteorologist in Charge at Raleigh gives the following description of destruction along this portion of the beach: "All traces of civilization on that portion of the immediate water front between the state line and Cape Fear were practically annihilated. Grass-covered dunes some 10 to 20 feet high along and behind which beach homes had been built in a continuous line 5 miles long simply disappeared, dunes, houses and all. The paved roadway along which the houses were built was partially washed away, partially buried beneath several feet of sand. The greater part of the material from which the houses had been built was washed from one to two hundred yards back into the edge of low-lying woods which cover the leeward side of the islands. Some of this material is identifiable as having been parts of houses, but the greater portion of it is ground to unrecognizable splinters and bits of masonry. Of the 357 buildings which existed on Long Beach, 352 were totally destroyed and the other 5 damaged. Similar conditions prevail on Holden Beach, Ocean Isle, Robinson Beach, and Colonial Beach. In most cases it is impossible to tell where the buildings stood. Where grassy dunes stood there is now only flat, white, sandy beach."

At Wrightsville Beach water was about 5 feet deep over the island. Eighty-nine houses were destroyed and 530 damaged, resulting in an estimated $3,000,000 loss. One-half of the taxable wealth was lost at Carolina Beach where 475 houses were destroyed and 1,365 damaged. In Wilmington many stores lost plate glass windows and there was much damage to buildings and roofs. Water in the river reached the highest stage of record. There was great loss due to flooding of buildings and warehouses along the river banks. Many ships in the Wilmington Reserve Fleet (mothball ships) broke loose and losses were estimated at $1,000,000. All communications to Wilmington were destroyed. One-half the telephones (10,500) in the Wilmington section were knocked out.

Damage was general over Brunswick County. At least 10 persons drowned as the hurricane sent storm waves smashing into beach fronts. Of a group of 11 persons on Ocean Island Beach, seven died or were missing. This beach was virtually wiped out. Of 35 cottages on the beach only two were left standing, and they had been moved a mile from their original foundations by the wind-driven waves. At Robinson Beach all 72 buildings were destroyed; Colonial Beach, all 24 buildings destroyed; Caswell Beach, 11 of 22 buildings destroyed and others damaged; Wilmington Beach, 73 buildings destroyed, 42 suffered major damage, and 63 minor damage.

Farther up the coast Swansboro, Morehead City, and Beaufort suffered serious damage. At Atlantic Beach, near Morehead City, the destruction resembled that at Wrightsville.

From Cape Fear to Cape Lookout property damage along the ocean front probably averaged about 50 percent, but it was generally much lighter beyond that point.

North of Cape Lookout beach damage was relatively light. Tidewater rose into the lower lying portions of cities along the broad-mouthed rivers emptying on the coast; considerable damage was done to residential and business property in Washington, and some lesser flooding occurred in New Bern and Elizabeth City.

Effects of the hurricane as it passed inland were remarkable. Forests of pine and other trees appeared to be scorched by fire. All trees and plants along the coast appeared to have been burned. Groves of pecan trees were heavily damaged. Building destruction is said to have been greater in the interior sections of North Carolina than at inland points near the coast. From all indications the hurricane did not decrease in intensity as it moved into the interior.

Inland, out of reach of the rising waters, a tremendous area of North Carolina received heavy damage from high winds. An estimated one-third of all buildings east of the 80th parallel received some damage. Roofs and television aerials were the most widely hit but some radio towers, outdoor theaters, and many signboards were counted among the losses. A number of bridges were damaged beyond immediate use, the largest being the span between Morehead City and Beaufort. Throughout the stricken areas about 4,000 dwellings, 10,000 farm buildings, and 1,000 business buildings were destroyed or suffered major damage. Minor damage was caused to 20,000 dwellings, 15,000 farm homes, and 4,000 business structures. There was considerable loss in timber and shade trees in the eastern two-thirds of the State. Damage to public utilities and highways in the State was estimated at $10,000,000, of which more than $1,500,000 to $2,000,000 was to power and communication lines and facilities. Thirty counties reported damage to school buildings. Practically every airport in eastern and central North Carolina suffered some damage.

At least 10 stations in North Carolina reported the highest 24-hour rainfall amounts of record in connection with Hazel. These amounts ranged from around 6½ inches at Burlington, High Point, and Lexington up to 9.72 inches at Carthage.

Most North Carolina crops were harvested before the storm struck. The heaviest damage was probably suffered by corn, which lay mature in the fields.

Nineteen deaths resulted from the hurricane in North Carolina. All were in the Long Beach-Holden Beach-Ocean Isle area. Total inland crop and property damage in North Carolina was close to $100,000,000.

Tide heights and wind speeds as reported by the Wilmington Office of the Weather Bureau were as follows:

Little River Inlet	14.5	feet above mean low water, wind	150	m.p.h.
Calabash	18.0	" " " " " "	"	"
Holden Beach	17.6	" " " " " "	"	"
Oak Island	10.0	" " " " " "	140	"
Southport	13.0	" " " " " "	--------	
Wilmington (Cape Fear River)	8.2	" " " " " "	98	"
Wrightsville Sound	14.6	" " " " " "	125	"
Beaufort-Morehead City	8.8	" " " " " "	100	"
Atlantic	5.0	" " " " " "	85	"

(All wind speeds estimated except at Wilmington)

The State's commercial fishing industry suffered damage totaling $1,506,313.

The rapid northward movement (40 to 50 m.p.h.) carried the center of the hurricane through Virginia from Brunswick County to Loudoun County between 2 and 6 p.m., passing near Fredericksburg. Hurricane force winds with gusts 80 to 100 m.p.h. were experienced near the path of the storm center and eastward to the coast. Wind damage was widespread over most of the State.

At Norfolk winds were 78 m.p.h. from the south at 4:07 p.m., which set an all time high for the fastest mile at this station, and extreme velocities of over 100 m.p.h. were reached several times in midafternoon. Norfolk was much farther from the storm center than Richmond, yet winds were 30 m.p.h. higher than at Richmond, where they reached 70 or more m.p.h. in gusts.

Rainfall was relatively light in the coastal area but increased sharply west of the storm center, and totals ranged from 5 to 10 inches in an area 40 to 75 miles west of the hurricane track. The hurricane caused widespread wind damage over most of the State, the worst occurring in Tidewater and Southside, Virginia, and torrential rains in the Great Valley section which produced considerable topsoil loss in that area.

Damage in the Norfolk area was estimated at $3,500,000, of which $2,500,000 was in the Metropolitan area. The hurricane left 100,000 telephones out of order and the Virginia Electric Power Company estimated that 75,000 customers were temporarily without electricity.

Total damage for the State was conservatively estimated at $15,000,000. About 18,000 homes and a considerable number of farm and business buildings were damaged. The number of trees damaged or destroyed was in the hundreds of thousands. Much damage was done to power and telephone lines. Close to half of their individual services in the State were knocked out for varying periods of time. The losses were caused in most cases by falling trees and amounted to more than $2,000,000. A 150-foot microwave telephone tower was toppled near Warsaw. Two hundred plate glass store fronts in the Richmond area were broken. Crop losses for the State as a whole were considerable but monetary estimates are not available. Truck crops in the Eastern Shore-Norfolk areas were hard hit, blown over and bruised. Thousands of bushels of apples were blown to the ground but many of these were salvaged. Unharvested corn in the eastern sections of the State was flattened. Some housed tobacco was damaged when barns were unroofed. Turkey growers, mostly in the Shenandoah Valley, lost between 150,000 and 250,000 turkeys when poultry sheds were wrecked. Marine damage ran high. Crab potters lost as high as 80 percent of their traps. There was considerable loss to poundnet equipment. Oyster beds in the rivers were seriously damaged by being covered with silt or carried away. Many small craft sank or were driven ashore, and a tug capsized. Piers were demolished and private docks were swept away in the Tidewater rivers. A number of idle ships of the James River Reserve Fleet (Maritime Administration) broke loose from part of their moorings and tangled with other vessels. The battleship Kentucky also broke its moorings and ran aground some 1,000 feet from its berth. Several planes were damaged at Portsmouth, Patrick Henry Airport, and Kellam Field. Installations at Washington National Airport were also damaged.

The storm left 13 dead in Virginia, of these 4 were lost in the capsizing of the tug Indian in the James River about 25 miles southeast of Richmond. Most of the others were from contacts with electric wires felled by the storm.

The center of the hurricane passed midway between Washington, D. C., and Leesburg, Va., about 5:10 p.m., but a dead calm was experienced as far east as Forestville and Lanham, Md., and as far north as Silver Spring, Md. Gusts up to 98 m.p.h. were recorded at the National Airport at 5:07 p.m. and sustained winds of 78 m.p.h. at 4:51 p.m. Washington felt the effects of the storm from early afternoon until after 7 p.m.

Damage in the District of Columbia to power facilities, telephone services, and trees, added to the cost of removal of debris, amounted to $595,000. The Public Housing Administration estimated $300,000 damage to World War II-built public housing projects in Virginia, Maryland, and the District of Columbia. There were three deaths reported in the District.

The center of the hurricane passed from Virginia into Maryland in the vicinity of Harpers Ferry, W. Va., during the afternoon of the 15th. Damage from winds in West Virginia was relatively minor, except for that to the apple crop. Precipitation resulting from this hurricane and related weather systems on the 15th caused flooding in the east portion of the State, and resulted in extensive property damage. On the 15th and 16th rainfall was extremely heavy in West Virginia, except in the southwest portion, and established new 24-hour records at many stations, mostly in the Charleston-Martinsville line. The hurricane path through Maryland lay near Frederick and Hagerstown.

At Baltimore winds reached 84 m.p.h. in gusts from the southeast at 6:10 p.m. The highest tide recorded as a result of the hurricane was 6.0 feet above mean low tide (Ft. McHenry). Basements and streets adjacent to the harbor were flooded. In the Maryland section of the Chesapeake Bay the highest tide was reported variously from about 3 to 7 feet above mean low tide.

In the Maryland-Delaware area damage to homes was in general limited to roofs and windows; however a limited number suffered major damage due to trees falling against the homes, entire roofs being blown off, or tides lifting the homes from foundations. By far the greatest damage was to outbuildings such as poultry houses or tobacco barns. The 1-minute maximum wind of 58 m.p.h. and the gusts of 98 m.p.h. broke all records for Wilmington, Del. Although building losses were heavy, it is estimated that less than 1 percent of the 1954 tobacco crop was destroyed, approximately 300,000 pounds. The total loss for barns is estimated at approximately $1,000,000, and the damage to the tobacco crop at approximately $200,000. The poultry industry probably suffered the greatest damage of any interest in the area.

On the Eastern Shore, in Delaware and southern Maryland alone, it is estimated that 25 to 50 percent of all TV aerials suffered some damage. Damage to roofs and windows from falling limbs was also widespread. While there is no definite way to estimate all this damage, reports from insurance companies, county officials, and others indicate that the total for the two-state area will approach 8 to 10 million dollars. Damage to boats, mostly on Maryland's lower eastern shore, was estimated at $750,000 after salvage. Loss to docking facilities was estimated at approximately $1,000,000. Damage to bridges and roads in tidal areas near the bay was appreciable. Most of this damage occurred in southern counties, but some also occurred in northern portions of the bay area. Total damage was estimated at $300,000 to $400,000.

Erosion damage caused by the spray of salt water to adjacent land areas, and flooding of low-lying farm lands in those counties bordering the Chesapeake Bay and Atlantic Ocean caused appreciable damage to the soil, trees, and shrubbery. Total salt damage and loss of land by erosion are estimated at $1,000,000 to $1,500,000. Damage to timber and replacement costs for trees in residential areas as well as costs for clearing and cutting of trees blown down by the storm are difficult to estimate since much of the work of clearing trees was accomplished by utilities and telephone companies. However, total additional loss is estimated at $500,000.

In Maryland the greatest damage to poultry houses and other outbuildings occurred in the southern counties, although some damage was reported over the entire State as far west as Washington County. Damage to poultry buildings and loss of poultry are estimated at four to five million dollars, and damage to other outbuildings at about the same figures, making a total of close to $9,000,000. Damage to the apple crop, including damage to trees and loss of apples, amounted to $100,000. Damage to homes and commercial buildings of all kinds, while minor in most instances, was widespread over most of the State. Surveys indicate that approximately 500 tobacco barns in southern Maryland were destroyed and an additional 500 damaged.

In Delaware it was variously estimated that between 25 and 50 percent of all poultry houses were destroyed. Counting this and loss of other farm buildings and chickens, the Agricultural Extension Service of Delaware estimated total loss at approximately $15,000,000. About 3 percent of the apple crop in Delaware was blown to the ground. Damage to trees and loss of apples were estimated at approximately $60,000.

Practically all damage to power facilities was caused by trees and tree limbs falling across wires. Wires were down at about 1,800 different locations in Maryland and 150,000 customers were out of service. Approximate cost of repairs to systems was $511,000. The gas pipe trestle over Bear Creek, Maryland, was damaged by wind and water to the extent of $50,000. In Delaware damage to power facilities was estimated at $25,000.

Damage to telephone service was due mainly to falling trees and broken power wires dropping across lines. Approximate damage from this cause in Maryland was $700,000 and in Delaware $175,000.

The heaviest rains in connection with the hurricane in Maryland occurred in the western part of the State where total amounts of rain were near or over 6 inches over much of Garrett County and 2 to 5 inches from Frederick County west to Allegany County. Flash floods in the tributary streams of western Maryland were the highest in the memory of the older people in the area. Damage, limited to roads and bridges, was not extensive.

Total estimated damage in Maryland and Delaware as a result of the hurricane was between $35,000,000 and $40,000,000. There were six deaths in this area.

In New Jersey damage from Hazel was spotty. For the State as a whole it was much less than by the hurricane of September 14, 1944, but at Somerville it was called the most devastating ever to strike that area. Damage to the apple crop in this State amounted to an estimated $2,500,000; to homes and buildings, $4,000,000; to shade and fruit trees, $1,000,000; to electric and gas services, $1,300,000; to telephone services, $1,000,000; miscellaneous damage was estimated at $200,000. Five persons lost their lives in accidents involving fallen power lines and traffic mishaps attributable to the storm.

The hurricane rampaged through east-central Pennsylvania on the 15th and caused considerable loss of life and property. An observer at Shippensburg, Pa., reported that the "eye" passed over that station between 6:30 and 6:50 p.m. on the 15th.

Wind damage was apparently most general and severe in the eastern half of Pennsylvania. Peak gusts reached 94 m.p.h. at Philadelphia, 86 m.p.h. at Reading, 80 m.p.h. at Harrisburg, and 58 m.p.h. at Philipsburg. Major damage was spotty but more or less general. Rail traffic was delayed or halted by downed trees, wires, and poles. Many highways were blocked by fallen trees and downed wires. Ships and small craft were torn loose from their moorings.

The eastern apple orchards were especially hard hit, with an estimated 1,000,000 bushels of fruit knocked to the ground.

Scores of homes and buildings suffered major structural damage; hundreds of others suffered minor damages. Hundreds of television antennas were damaged. Thousands of trees were uprooted or broken by the winds. Over the eastern part of the State (from Williamsport south and east) more than 600,000 electric power users were without service at one time or another. Over 70,000 telephone subscribers were without service for varying periods. Newspaper reports indicated a toll of 13 persons killed in central and eastern Pennsylvania and 13 deaths in western Pennsylvania during the flooding. The Weather Bureau Office in Philadelphia estimated damage in that area at $2,300,000. The east-central counties (including the Allentown area) estimated damage near $2,000,000. Elsewhere, damages probably reached $1,000,000, making a total of $5,300,000 for this part of the State.

The American Red Cross (Harrisburg Chapter) furnished the following figures for flood effects in western Pennsylvania following the heavy rains:

Number of persons killed	13
Number of persons injured	29
Homes with major damage	263
Homes with minor damage	2117
Other buildings destroyed	212
Total number of families suffering loss	2929

Most of the flooding due to the rains associated with the hurricane occurred in the Pittsburgh watershed which rather closely coincides with the Ohio Drainage division and includes most of the heavier rain area. Newspaper reports indicate that flood damages may have amounted to between $10,000,000 and $15,000,000 in the basin.

Maritime interests along the Delaware County shore line suffered heavy losses. At least 500 boats were battered, split, sunk, or lost, causing an estimated $1,000,000 damage. Piers broke off and washed away, floats sank, a large two-master sailboat was carried across the river and flung up with scores of other craft on Tinicum Island, and several $50,000 cabin cruisers were wrecked and submerged. The Marcus Hook reporting station of the Maritime Exchange was knocked out by the storm when the pier connecting it with the U. S. Quarantine station blew away.

Hardest hit were the ship yards in the Essington area. Every pier was either totally wiped out or partly torn away and at the Corinthian Yacht Club basin a 50-foot cruiser sank. Another large craft, a 40-foot Japanese-made boat, was lost and a third smaller boat went down. At the Philadelphia Seaplane Base, Wanamaker Avenue, Essington, more than half of the 80 boats tied up and one of 12 seaplanes were damaged.

The hurricane entered south-central New York about 9:00 p.m. on the 15th. The areas that took the brunt of the storm were Syracuse, Utica, Rome, Binghamton, Elmira, Corning, Cortland, Seneca Falls, and Hornell, but strong winds battered the entire State while heavy rains fell in western counties. The storm began to acquire serious proportions in the Southern Tier Counties about 7:30 p.m. and the center passed through the area shortly before 10:00 p.m.

Property damage in the aggregate ran into millions of dollars, but the exact monetary loss is not known. The New York Telephone Company reported 70,000 telephones in the State out of order. The repair cost was estimated at $1,000,000. A total estimate of other losses in the State cannot be made but the effects of the storm in particular communities are described in the following paragraphs:

At the Syracuse Weather Bureau Airport Station unofficial gusts in excess of 80 m.p.h. were reported but recorded gusts of 75 m.p.h. occurred before power failure terminated the record. Wind damage in Syracuse and Onondaga County was estimated at $1,000,000, the greatest amount being due to breakage of power and communication lines by falling trees. There were 3 deaths, 15 injuries, 50,000 power failures, and 10,000 instances of broken telephone service reported in Onondaga, Oswego, Cortland, and Madison Counties. Some 500 trees were uprooted or badly damaged in the Syracuse area, necessitating a clean-up cost of $30,000. A $50,000 See-Bee plane broke from its moorings at the airport and was a complete loss. Many roads were closed by fallen trees during the night, some automobiles crushed and roofs damaged.

At the Broome County Airport, gusts reached a velocity of 94 m.p.h. at 8:54 p.m. and again at 9:46 p.m. The storm's fury inflicted widespread damage on buildings of 25 percent of Broome County's farms. Roofless barns, silos, and storage buildings, and damaged homes on about 600 county farms were vivid mementos of the first known hurricane to batter the Southern Tier. Throughout the area power and communication lines were badly broken, automobiles damaged, and highways blocked by falling trees.

In western New York, Canadaigua, Bath, Hornell, Shortsville, Macedon, and Clifton Springs, suffered power failures. At least three persons were injured in Ithaca, when the power failed in the downtown shopping district. In Norwich two persons seated in an automobile were killed by a falling chimney. Trees were uprooted and broken, power and communication services disrupted, and some buildings damaged in Seneca, Ontario, Wayne, and Yates Counties.

As the storm moved northward it joined forces with a strong center over Buffalo, which resulted in heavy rain in the western counties. First to feel the effect were Chautauqua and Cattaraugus Counties. Jamestown and the immediate area recorded about 5 inches of rain and some city streets were under 14 to 17 inches of water. Many highways were flooded and several bridges washed out.

Delaware and Cortland Counties along with the remainder of central New York suffered broken utility lines and damaged buildings. High winds also swept over the Adirondack area.

Despite gusts ranging up to 100 m.p.h. at New York City, coastal sections suffered comparatively light loss. Some utility services were interrupted, signs blown down, and a few roofs damaged.

Twenty-one deaths in New York State were attributed to the storm, of which 5 were caused by falling objects, 5 by electric shock, 4 by automobile accidents, 3 by falls, and 4 by other causes.

New England escaped the fury of hurricane Hazel, as the center of the storm passed 200 or more miles west of the western border of the area. Sustained wind speeds were less than 50 m.p.h. with the exception of peak gusts of 55 to 65 m.p.h. in Connecticut and Rhode Island and 70 m.p.h. as the fastest mile at Burlington, Vt. One death resulted from the storm in this section and damage was estimated at $35,000. Only the extreme western edge of the area experienced damaging winds. A few localities reported considerable damage to roofs and to power and telephone lines downed by falling trees.

Leaving New York, Hazel crossed Lake Ontario carrying death and destruction into Canada. Highest winds were estimated at near hurricane force near the center as the hurricane moved into Canada. Winds of 110 m.p.h. were reported in Canada. More than 7 inches of rain turned the Humber River, which flows along Toronto's western outskirts, into a raging torrent that trapped victims in homes and automobiles. The storm caused 76 deaths and damage estimated at $100,000,000 in the Toronto area.

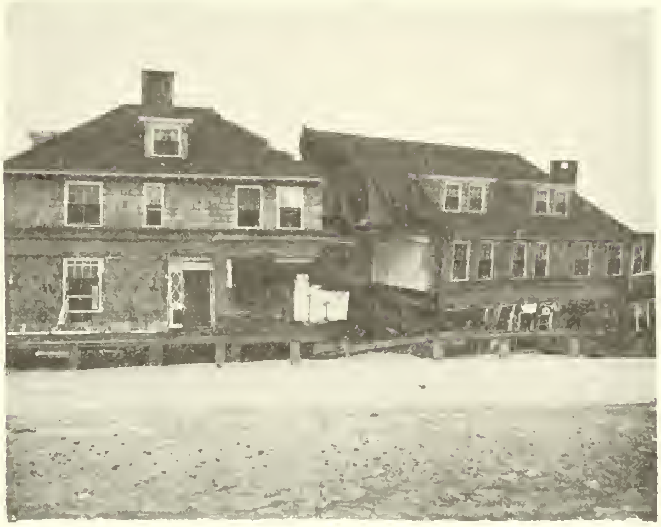
Damage and deaths by States from Hurricane Hazel:

	Damage	Deaths
South Carolina	$27,000,000	1
North Carolina	136,000,000	19
Virginia	15,000,000	13
District of Columbia	595,000	3
Delaware and Maryland	40,000,000	6
Pennsylvania	20,000,000	26
New York	3,000,000	21
New Jersey	10,000,000	5
New England	35,000	1
Totals	251,630,000	95

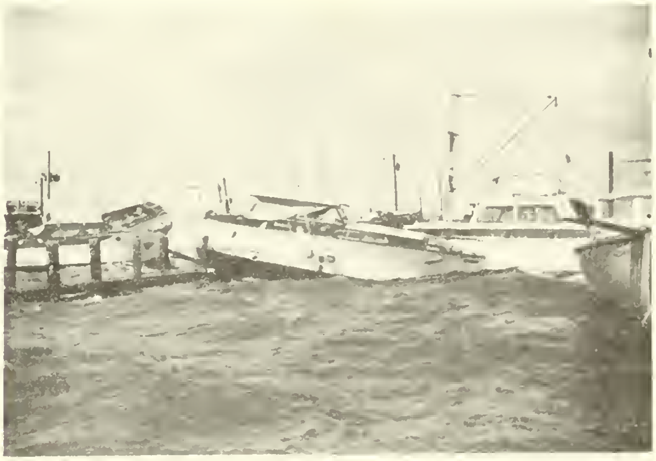
Damage and deaths outside of the United States

Canada	$100,000,000	78
Grenadine Islands	42,500	0
Haiti	Several millions	400-1000
Bahama Islands	Minor	6

A tabular listing of meteorological data associated with this storm is contained in Table 18.



Canonchet Clubhouse, Canonchet, R. I., split in two by full sweep of wind and flood during passage of hurricane Carol on August 31, 1954.
(Photo furnished by the Narragansett Times, Inc., Wakefield, R. I.)



Like toy boats, these cabin cruisers were wedged between pier pilings at Galilee, R. I., during passage of hurricane Carol on August 31, 1954.
(Photo furnished by the Narragansett Times, Inc., Wakefield, R. I.)

The steeple atop historic Old North Church in Boston topples August 31, 1954, at height of passage of hurricane Carol which swept through New England. The steeple was built in 1806 to replace the original steeple which was toppled by a hurricane in 1804. The Old North belfry and lantern window, from which lanterns were hung to signal Paul Revere that the British were coming, date back to 1723 when the church was built.
(Wide World Photo, Inc.)

Remains of the Breakers Hotel at Kure Beach, N. C., after passage of hurricane Hazel on Oct. 15, 1954.
(Photo by R. L. Frost, W.B.O., Wilmington, N. C.)

HURRICANE DATA

Table 18

for storm of

August 26-31, 1954 (CAROL)

Station	Date	Pressure		Wind						Rainfall	Miscellaneous
		Low	Time	5-min. max.	Time	Fastest Mile	Time	Gusts	Time		
Charleston, S.C., WBAS	30	-----	---------	---------	---------	31 N	---------	-----	-----	-----	
Wilmington, N.C., WBAS	30	29.00	---------	---------	---------	42 N	---------	55	-----	1.91	
Hatteras, N.C., WBO	30	28.70	---------	---------	---------	7B N	---------	98	-----	5.55	
Cherry Point, N.C.	30	-----	---------	---------	---------	-------	---------	65	-----		
Norfolk, Va.	30	29.37	---------	---------	---------	43 NE	---------	-----	-----	-----	Lowest pressure 2 a.m. 31st. Tide 5.6 ft. above MLW.
Baltimore, Md.	31	29.56	---------	---------	---------	34 NW	---------	-----	-----	-----	
Atlantic City, N.J., NAS	31	-----	---------	---------	---------	37 NW	7:26 a.m.	55	7:58a	-----	
Atlantic City, N.J., WBO	31	29.17	---------	---------	---------	57 NE	---------	-----	-----	2.48	
Trenton, N.J., WBO	31	29.36	---------	---------	---------	32 N	7:29 a.m.	-----	-----	-----	
Trenton, N.J., McGuire Air Force Base	31	-----	---------	---------	---------	-------	---------	39	7:57a	-----	
Newark, N.J., WBAS	31	29.24	---------	---------	---------	43 WNW	8:54 a.m.	55	9:09a	.9B	
Long Branch, N.J.	31	-----	---------	---------	---------	56 NNW	9:44 a.m.	60	9:43	-----	
La Guardia Field, N.Y., WBAS	31	-----	---------	---------	---------	50 N	B:10 a.m.	62	5:0B	2.15	
Central Park Met'l. Obs., N.Y.	31	-----	---------	---------	---------	36 NE	5:0B a.m.	-----	-----	1.19	
Shinnecock Lifeboat Sta., Hampton Bays, L.I., N.Y.	31	-----	---------	---------	---------	-------	---------	103	8:28a	-----	
Suffolk County, N.Y., (A.F.B.)	31	-----	---------	---------	---------	-------	---------	100	8:27a	-----	
Mitchell A.F.B., N.Y.	31	-----	---------	---------	---------	-------	---------	59 NNW	8:45a	-----	
White Plains, N.Y., Westchester County Airport	31	-----	---------	---------	---------	60 NNW	9:00 a.m.	-----	-----	-----	
New York, WBO	31	29.21	---------	4B NW	B:30 a.m.	61 NW	8:56 a.m.	-----	-----	1.32	
Brookhaven Nat'l. Lab., N.Y.	31	-----	---------	---------	---------	-------	---------	85	-----	-----	125 m.p.h. winds at 410 ft. level.
Block Island, R.I., WBAS	31	28.50	10:55 a.m.	---------	---------	100	10:05 a.m.	135	10:05a	3.31	
Providence, R.I., WBAS	31	2B.69	10:45 a.m.	---------	---------	90 ESE	10:30 a.m.	105 ESE	10:30a	2.79	
Quonset Point, R.I., NAS	31	28.63	10:40 a.m.	---------	---------	90	10:25 a.m.	125	10:25a	-----	
Bridgeport, Conn., WBAS	31	2B.87	9:20 a.m.	---------	---------	-------	---------	60 NNE	9:28	1.62	
Hartford, Conn., (Bradley Fld.)	31	28.89	10:40 a.m.	---------	---------	56 NE	11:51 a.m.	70 NE	11:32a	2.09	
New Haven, Conn., WBAS	31	2B.77	9:10 a.m.	---------	---------	3B NE	9:2B a.m.	65 NE	xx	2.74	
Hartford, Conn., WBAS	31	-----	---------	---------	---------	56 NE	9:41 a.m.	64	11:25a	1.95	
Windsor Locks, Conn.	31	-----	---------	---------	---------	-------	---------	70	-----	-----	
Putnam, Conn.	31	2B.71	11:15	---------	---------	78	9:30 a.m.	80	9:45	4.25	
Storrs, Conn.	31	-----	---------	---------	---------	60	10:20 a.m.	70	10:20	3.51	
Boston, Mass., WBAS	31	28.83	11:48 a.m.	---------	---------	86 SE*	11:26 a.m.	100 SE	11:26a	2.58	
Nantucket, Mass., WBAS	31	29.32	---------	---------	---------	72 SE	9:00 a.m.	77	-----	1.89	
Pittsfield, Mass., WBAS	31	28.82	11:15 a.m.	---------	---------	-------	---------	*52	12:00M	2.0B	
Blue Hill Met'l. Obs., Milton, Mass.	31	-----	---------	---------	---------	93	---------	125 SE	-----	-----	
Edgartown, Mass.	31	29.00	---------	---------	---------	-------	---------	95	12:02p	1.47	
Falmouth, Mass.	31	29.17	11:00 a.m.	---------	---------	63 ESE	9:10 a.m.	B8 ESE	9:10a	1.36	
Holyoke, Mass.	31	28.81	12:00 M	---------	---------	45	12:00 M	58	12:00M	2.36	
Lawrence, Mass.	31	28.84	12:20 p.m.	---------	---------	52	9:30 a.m.	110	11:30a	3.06	
Martha's Vineyard, Mass.	31	29.20	10:00 a.m.	---------	---------	65 E	10:00 a.m.	94 E	10:00a	-----	
Provincetown, Mass.	31	29.08	12:00 M	---------	---------	B3	10:45 a.m.	-----	-----	1.42	
Rockport, Mass.	31	28.96	12:50 p.m.	---------	---------	70	11:20 a.m.	83	11:10a	2.27	
Salem, Mass., U.S.C.G.	31	28.92	12:20 p.m.	---------	---------	75	12:00 M	93	11:30a	1.77	
South Weymouth, Mass.	31	28.68	10:50 a.m.	---------	---------	69	9:50 a.m.	94	10:2Ba	-----	
W. Medway, Mass.	31	28.60	11:35 a.m.	---------	---------	92	12:[illegible]2 p.m.	100	12:05p	4.93	
Westover, Mass. U.S.A.F.	31	28.8B	11:30 a.m.	---------	---------	68 NNE	9:56 a.m.	71 NNE	10:49a	2.08	
Worcester, Mass.	31	28.71	12:00 M	---------	---------	45 NE	10:25 a.m.	90 NE	10:20a	4.97	
Woods Hole, Mass.	31	-----	---------	---------	---------	90	---------	103	-----	-----	
Concord, N.H. WBAS	31	28.84	1:15 p.m.	---------	---------	56 E	---------	*63	12:50p	3.56	
Berlin, N.H.	--	-----	---------	---------	---------	40	2:00 p.m.	60	2:00p	2.40	
Lakeport, N.H.	31	28.97	1:50 p.m.	---------	---------	-------	---------	60	1:10p	5.45	
Lebaoon, N.H., CAA	31	-----	---------	---------	---------	22	12:28 p.m.	41	12:28p	2.68	
Manchester, N.H.	31	28.80	12:50 p.m.	---------	---------	3B W	3:31 p.m.	52 E	12:30p	3.65	
Milford, N.H.	31	28.59	12:40 p.m.	---------	---------	73	11:30 a.m.	90	11:32a	3.77	
Pinkham Notch, N.H.	31	29.19	1:30 p.m.	---------	---------	-------	---------	75	1:30p	4.43	
Caribou, Me., WBAS	31	29.52	10:28 p.m.	---------	---------	42 ENE	---------	*45	5:28p	.48	
Portland, Me., WBO	31	29.15	3:00 p.m.	---------	---------	69 E	---------	*78	1:21p	2.26	
Augusta, Me., WBAS	31	29.24	4:28 p.m.	---------	---------	62 ESE	2:45 p.m.	85 ESE	2:45p	1.57	
Bar Harbor, Me., WBO	31	29.53	5:00 p.m.	---------	---------	35	5:00 p.m.	80	5:00p	.21	
Bangor, Me. (Dow Fld.)	31	29.46	5:27 p.m.	---------	---------	37 SE	3:57 p.m.	79 ESE	3:27p	1.03	
Brunswick, Me., U.S.N.	31	29.21	3:30 p.m.	---------	---------	67	2:19 p.m.	84	3:24p	1.19	
Greenville, Me., WBO	31	-----	---------	---------	---------	22	4:00 p.m.	40 E	4:00p	1.59	
Houlton, Me.	31	29.52	9:28 p.m.	---------	---------	28	11:05 p.m.	48	10:00p	.50	
Old Town, Me.	31	29.34	6:28 p.m.	---------	---------	30	6:28 p.m.	50	6:2Bp	1.09	
Burlington, Vt., WBAS	31	29.32	3:40 p.m.	---------	---------	38 N		50	2:25p	1.61	
Montpelier, Vt., CAA	31	-----	---------	---------	---------	25	12:28 p.m.	35	12:28p	1.50	
Newport, Vt.	31	28.55	6:20 p.m.	---------	---------	-------	---------	25	2:00p	1.42	

See footnotes at end of table.

HURRICANE DATA

Table 18

for storm of

September 6-11, 1954 (EDNA)

Station	Date	Pressure		Wind						Rainfall	Miscellaneous
		Low	Time	5-min. max.	Time	Fastest Mile	Time	Gusts	Time		
Charleston, S.C., WBAS	10	29.59	---------	---------	---------	24 N	12:30 p.m.	36 N	12:30p	-----	
Wilmington, N.C., WBAS	10	29.49	---------	---------	---------	34 N	---------	-----	-----	-----	
Manteo, N. C.	10	-----	---------	---------	---------	75	---------	-----	-----	-----	
Cape Lookout, N.C.	10	-----	---------	---------	---------	75	---------	-----	-----	-----	
Hatteras, N.C., WBO	11	28.70	---------	---------	---------	46 WNW	---------	-----	-----	-----	
Norfolk, Va.	11	29.33	---------	---------	---------	33 N	---------	55	1:32a	-----	Passed about 130 miles east of station. Tide 5.1 ft. above MLW at 8 p.m. 10th.
Newark, N.J., WBAS	11	29.24	---------	---------	---------	43 NW	---------	-----	-----	-----	
Atlantic City, N.J., WBO	11	-----	---------	---------	---------	65N or NW	9:12 a.m.	-----	-----	3.00	
Lakewood, N.J.	11	-----	---------	---------	---------	-------	---------	57	8:21a	4.81	
Long Branch, N.J.	11	-----	---------	---------	---------	55	8:07 a.m.	59	8:08a	4.59	
Trenton, N.J., WBO	11	-----	---------	---------	---------	35 NW	11:38 a.m.	-----	-----	2.85	
McGuire A.F.B., Trenton, N.J.	11	-----	---------	---------	---------	-------	---------	40	12:28p	2.86	
Atlantic City, N.J., NAS	11	-----	---------	---------	---------	39	6:27 a.m.	59	1:00p	3.94	
Barnegat Lifeboat Sta., N.J., U.S.C.G.	11	-----	---------	---------	---------	-------	---------	50	12:30p	-----	
Reading, Pa., WBO	11	29.48	---------	---------	---------	38 NW	---------	-----	-----	-----	
N.Y. International Airport, WBAS	11	-----	---------	---------	---------	-------	---------	60	8:50a	-----	
Westchester County Airport, White Plains, N.Y.	11	-----	---------	---------	---------	-------	---------	60	11:00a	-----	
La Guardia Field, N.Y., WBAS	11	29.29	11:05 a.m.	---------	---------	52	10:49 a.m.	55	11:59a	2.93	
Suffolk County AFB, Westhampton Beach, L. I., N.Y.	11	-----	---------	---------	---------	-------	---------	75	12:15a	4.46	
New York, WBO	11	29.21	10:52 a.m.	47 NW	2:58 p.m.	61 NW	12:18 p.m.	-----	-----	-----	
Shinnecock Lifeboat Sta., Hampton Bays, N.Y.	11	-----	---------	---------	---------	56	1:05 p.m.	-----	-----	-----	
Bridgeport, Conn., WBAS	11	29.14	10:55 a.m.	---------	---------	40	---------	56 NNW	10:53a	3.50	
New Haven, Conn., WBAS	11	29.08	12:15 p.m.	---------	---------	35 NW	11:35 a.m.	50 NNW	11:35a	4.61	
Hartford, Conn., WBAS	11	-----	---------	---------	---------	52	11:51 a.m.	70	11:32a	3.10	
Stamford Museum, Courtland Park, Conn.	11	29.22	---------	---------	---------	*30	---------	50 NW	10:50a	3.67	
Storrs, Conn.	11	29.20	1:00 p.m.	---------	---------	40	---------	-----	-----	4.22	
Putnam, Conn.	11	29.00	12:45 p.m.	---------	---------	65	---------	75 N	12:45p	5.40	
Block Island, R.I., WBAS	11	28.59	12:25 p.m.	---------	---------	87	---------	110	1:30p	4.04	
Providence, R.I., WBAS	11	28.73	1:25 p.m.	---------	---------	55	2:44 p.m.	79	2:44p	4.37	
Quonset Point, R.I., NAS	11	28.61	1:35 p.m.	---------	---------	-------	---------	93 NNW	3:06p	8.72	
Blue Hill Met'l. Obs., Milton, Mass.	11	-----	---------	---------	---------	75	---------	101 NW	-----	5.23	
Boston, Mass., WBAS	11	28.74	2:18 p.m.	---------	---------	74	1:04 p.m.	87 NW	3:55p	5.63	
Bedford, Mass., WBAS	11	28.91	2:28 p.m.	---------	---------	80	---------	90	3:18p	8.48	
Hyannis, Mass.	11	28.14	2:14 p.m.	---------	---------	80	---------	100	3:20p	4.08	
Lawrence, Mass.	--	-----	---------	---------	---------	55	---------	85	3:00p	6.96	
Martha's Vineyard Apt., Mass.	11	28.10	2:00 p.m.	---------	---------	-------	---------	120 NW	3:00p	-----	
Nantucket, Mass., WBAS	11	28.17	1:45 p.m.	---------	---------	73	1:04 p.m.	90	1:05p	1.64	
Rockfort, Mass	11	28.57	3:15 p.m.	---------	---------	75	---------	85 N	3:30p	5.80	
Salem, Mass., U.S.C.G.	11	28.72	3:00 p.m.	---------	---------	46	4:17 p.m.	87	4:17p	4.57	
So. Weymouth, Mass.	11	28.44	2:50 p.m.	---------	---------	-------	---------	88	-----	-----	
W. Medway, Mass.	11	28.83	2:15 p.m.	---------	---------	50	3:00 p.m.	64	3:00p	6.87	
Woods Hole, Mass.	11	27.77	1:53 p.m.	---------	---------	63	---------	95	2:47p	-----	
Worcester, Mass.	11	29.01	2:28 p.m.	---------	---------	60	---------	81	-----	5.05	
Concord, N.H., WBAS	11	29.12	---------	---------	---------	37	---------	42	-----	-----	
Durham, N.H.	11	29.13	3:13 p.m.	---------	---------	-------	---------	*60	4:00p	6.49	
Lakeport, N.H.	11	29.20	2:15 p.m.	---------	---------	-------	---------	45 NW	5:40p	3.55	
Manchester, N.H.	11	28.98	2:00 p.m.	---------	---------	52	---------	59	2:33p	4.99	
Milford, N.H.	11	28.87	2:36 p.m.	---------	---------	-------	---------	70 N	2:36p	4.59	
Augusta, Me., WBAS	11	28.89	6:00 p.m.	---------	---------	55	---------	92 NNW	6:40p	5.78	
Bangor, Me. (Dow Fld.)	11	28.79	7:28 p.m.	---------	---------	60	---------	90	8:10p	5.98	
Bar Harbor, Me., WBO	11	28.63	8:00 p.m.	---------	---------	60	---------	85	-----	3.35	
Brunswick, Me., U.S.N.	11	28.80	5:28 p.m.	---------	---------	67	---------	83	6:15p	8.05	
Eastport, Me.	11	28.47	8:45 p.m.	---------	---------	-------	---------	-----	-----	1.55	
Houlton, Me.	11	28.83	9:00 p.m.	---------	---------	40	---------	58	9:53p	5.20	
Millinocket, Me.	11	28.96	8:00 p.m.	---------	---------	30	---------	60	8:28p	4.28	
Old Town, Me.	11	28.66	7:28 p.m.	---------	---------	40	---------	62	8:28p	5.91	
Portland, Me., WBAS	11	28.88	4:55 p.m.	---------	---------	60 NW	---------	74 NW	5:40p	7.49	

See footnotes at end of table.

HURRICANE DATA

Table 18 — for storm of — October 5-16, 1954 (HAZEL)

Station	Date	Pressure		Wind						Rainfall	Miscellaneous
		Low	Time	5-min. max.	Time	fastest mile	Time	Gusts	Time		
Myrtle Beach, S.C.	15	28.47	9:15 a.m.	---------	---------	-------	---------	106 SW	10:01a	9.19	Tide 16.8 ft. and waves crested above 30 ft. "Eye" observed 9:20-9:45 a.m.
Charleston, S.C., WBAS	15	-----	---------	---------	---------	44 WNW	---------	60	8:22a	5.11	
Charleston, S.C., WBO	15	29.07	8:45 a.m.	40 WNW	---------	45	---------	65	-----	5.17	
Charleston, S.C., CAA	15	-----	---------	---------	---------	-------	---------	70	6:20a	-----	
Florence, S.C., WBAS	15	29.06	10:30 a.m.	---------	---------	45 NW	---------	64	9:13a	6.36	
Columbia, S.C., WBAS	15	29.31	8:30 a.m. -12:30 p.m.	---------	---------	15-25 NW	10:30 a.m.	-----	-----	1.38	
Little River Inlet, N.C.	15	%27.70	---------	---------	---------	-------	---------	*150	-----	-----	Tide 14.5 ft. above MLW. "Eye" passed over between 10:30 and 11:00 a.m.
Calabash, N.C.	15	-----	---------	---------	---------	-------	---------	*150	-----	-----	Tide 18.0 ft. above MLW.
Holden Beach Bridge, N.C.	15	27.90	---------	---------	---------	-------	---------	*150	-----	-----	Tide 18.0 ft. above MLW.
Lockwoods Folly Inlet, N.C.	15	28.30	---------	---------	---------	-------	---------	*140	-----	-----	
Oak Island, N.C.	15	28.60	---------	---------	---------	-------	---------	*140	-----	-----	Tide 10 ft. above MLW.
Masononboro Sound (Wrightsville Sound Drawbridge), N.C.	15	-----	---------	---------	---------	-------	---------	*125	-----	-----	Tide 14.6 ft. above MLW.
Wilmington, N.C., WBAS	15	28.68	11:05 a.m.	61 SE	10:42 a.m.	82 SE	10:42 a.m.	98 SE	10:45a	3.85	Tide 8.2 ft. above MLW. Wind shifted to SW at 11:35.
Beaufort-Morehead City, N.C.	15	-----	---------	---------	---------	-------	---------	*100	-----	.80	Tide 8.8 ft. above MLW.
Atlantic, N.C.	15	-----	---------	---------	---------	-------	---------	*85	-----	-----	Tide 8.0 ft. above MLW.
Raleigh, N.C., WBAS	15	28.75	---------	#62 WNW	1:30-1:35 p.m.	#73 WNW	1:30-1:35 p.m.	**90 WNW	1:30-1:35p	4.10	
New Bern, N.C.	15	-----	---------	46 SSW	---------	-------	---------	-----	-----	1.70	
Greensboro-High Point AP., N.C.	15	-----	---------	36 NW	12:31 p.m.	38 NW	12:31 p.m.	50	-----	6.24	
Charlotte, N.C., WBAS	15	-----	---------	39 NW	---------	-------	---------	46 NW	1:25a	-----	
Hatteras, N.C., WBO	15	29.25	1:24 p.m.	---------	---------	56 SE	10:58 a.m.	81	-----	1.18	
Goldsboro, N.C.	15	-----	---------	---------	---------	-------	---------	*120	-----	1.30	
Kinston, N.C.	15	-----	---------	---------	---------	-------	---------	*120	-----	1.28	
Faison, N.C.	15	-----	---------	---------	---------	-------	---------	*120	-----	1.89	
Lumberton, N.C.	15	-----	---------	---------	---------	-------	---------	86 NW	11:30a	5.74	
Norfolk, Va., WBAS	15	28.99	3:00 p.m.	60	3:30 p.m.	78 SSW	4:07 p.m.	100 SSW	2:45-4:30p	.63	All-time record winds.
Richmond, Va., WBAS	15	28.75	3:30 p.m.	56	3:30 p.m.	68 SE	3:30 p.m.	79	3:32p	1.15	All-time record winds.
Cape Henry, Va., WBO	15	29.04	3:00 p.m.	---------	---------	56 SW	3:49 p.m.	-----	-----	.40	
Blackstone, Va., CAA	15	-----	---------	---------	---------	63	4:28 p.m.	92	4:28p	1.76	
Danville, Va., CAA	15	-----	---------	---------	---------	34	1:30 p.m.	52	1:30p	5.61	
Front Royal, Va.	15	-----	---------	---------	---------	40	12:28 p.m.	46	12:28p	4.13	
Gordonsville, Va., CAA	15	-----	---------	---------	---------	46	4:30 p.m.	63	4:30p	3.92	
Lynchburg, Va., WBAS	15	-----	---------	---------	---------	37	1:29 p.m.	59	5:03p	4.98	
Roanoke, Va., WBAS	15	-----	---------	---------	---------	40	12:28 p.m.	69	2:58p	4.95	
Pulaski, Va.	15	-----	---------	---------	---------	36	11:30 a.m.	44	11:30a	1.40	
Washington, D.C., WBAS	15	-----	---------	66 SE	4:50 p.m.	78 SE	4:51 p.m.	98 SE	5:07a	1.73	All-time record winds.
Washington, D.C., City Office	15	-----	---------	40 SE	4:18 p.m.	42 SE	---------	76 SE	4:50p	1.85	
Baltimore, Md., WBAS	15	28.77	5:28 p.m.	61 SE	5:28 p.m.	73 SE	5:31 p.m.	84 SE	6:10p	1.28	Tide 6 ft. above MLW.
Frederick, Md., WBAS	15	-----	---------	---------	---------	37	2:26 p.m.	52	2:26p	1.44	
Salisbury, Md., CAA	15	-----	---------	---------	---------	52	6:00 p.m.	101	6:05p	.22	
Wilmington, Del., WBAS	15	-----	---------	---------	---------	58	7:25 p.m.	98	6:59p	.27	
Philadelphia, Pa., WBAS	15	-----	---------	---------	---------	66 SSW	8:02 p.m.	94 S	7:38p	.63	
Philadelphia, Pa., WBO	15	29.19	---------	65 S	7:44 p.m.	73 S	7:54 p.m.	-----	-----	.43	
Philipsburg, Pa., CAA	15	-----	---------	---------	---------	34	6:28 p.m.	57	7:25p	2.61	
Pittsburgh, Pa., WBAS	15	-----	---------	---------	---------	30	4:04 p.m.	48	2:32p	3.56	
Selinsgrove, Pa.	15	-----	---------	---------	---------	29	7:29 p.m.	46	7:29p	1.60	
Williamsport, Pa., WBAS	15	28.91	7:40 p.m.	---------	---------	34	8:08 p.m.	75 ESE	8:07p	1.02	
Allentown, Pa., WBAS	15	-----	---------	---------	---------	49	5:28 p.m.	82 E	8:01p	.79	
Altoona, Pa.	15	-----	---------	---------	---------	30	6:28 p.m.	61	1:30p	3.53	
Reading, Pa., WBO	15	-----	---------	---------	---------	72	7:09 p.m.	85	5:45p	1.03	
Avoca, Pa.	15	-----	---------	---------	---------	46	8:28 p.m.	80	7:45p	.83	
Brookville, Pa.	15	-----	---------	---------	---------	34	5:25 p.m.	44	5:25p	2.54	
Erie, Pa.	15	-----	---------	---------	---------	25	7:29 p.m.	50	7:29p	4.50	
Harrisburg, Pa., WBAS	15	-----	---------	41	5:27 p.m.	56	2:59 p.m.	80	6:42p	1.57	
Scranton, Pa., WBO	15	-----	---------	---------	---------	45	8:10 p.m.	-----	-----	.63	
Dover, N.J. Power and Light Co.	15	-----	---------	---------	---------	40	6:31 p.m.	64	6:36p	.65	
Atlantic City, N.J., N.A.S.	15	-----	---------	---------	---------	-------	---------	67	7:55p	.04	
Atlantic City, N.J., WBO	15	-----	---------	---------	---------	66	6:17 p.m.	-----	-----	.12	
Lakehurst, N.J., U.S. N.A.S.	15	-----	---------	---------	---------	-------	---------	75	6:53p	.20	
Lakewood, N.J.	15	-----	---------	---------	---------	-------	---------	72	7:11p	.13	
Barnegat Lifeboat Station, N.J.	15	-----	---------	---------	---------	63	8:55 p.m.	65	8:55p	-----	
Newark, N.J., WBAS	15	-----	---------	---------	---------	48	7:41 p.m.	76	7:30p	.31	
Teterboro Airport, N.J.	15	-----	---------	---------	---------	-------	---------	92	7:30p	-----	
Trenton, N.J., WBO	15	-----	---------	---------	---------	57	8:46 p.m.	-----	-----	.20	
Albany, N.Y., WBAS	15	-----	---------	37	10:12 p.m.	42	10:12 p.m.	69	8:25p	.20	
Buffalo, N.Y., WBAS	15	-----	---------	56	11:19 p.m.	63	11:38 p.m.	73	11:23p	1.66	
Binghamton, N.Y., WBAS	15	-----	---------	72 S	8:54 p.m.	72	8:54 p.m.	94	8:54p & 9:46p	.20	All-time record winds.
Glen Falls, N.Y.	15	-----	---------	---------	---------	41	8:28 p.m.	52	8:28p	-----	
Central Park, N.Y.	15	-----	---------	---------	---------	40	6:50 p.m.	55	7:40p	.37	

See footnotes at end of table.

HURRICANE DATA

Table 18—Continued for storm of October 5-16, 1954 (HAZEL)

Station	Date	Pressure		Wind						Rainfall	Miscellaneous
		Low	Time	5-min. max	Time	Fastest Mile	Time	Gusts	Time		
Floyd Bennett Field, Brooklyn, N.Y., U.S.N.A.S.	15	-----	---------	---------	---------	-------	---------	84	7:48p	0.35	
N.Y. International Airport, WBAS	15	-----	---------	---------	---------	-------	---------	65	7:50p	-----	
La Guardia Field, N.Y., WBAS	15	-----	---------	55	7:38 p.m.	66	7:38 p.m. & 8:02 p.m.	79	7:38& 8:02p	.16	
Shinnecock Lifeboat Station, Hampton Bays, L.I., N.Y.	15	-----	---------	---------	---------	-------	---------	55	10:35p	-----	
Mitchel Air Force Base, N.Y.	15	-----	---------	---------	---------	-------	---------	61	5:11, 6:59&, 7:33p	-----	
New York, N.Y., WBO	15	-----	---------	73 SE	7:47 p.m.	113 SE	7:49 p.m.	113	7:49p	.23	All-time record winds.
Laurel Hill, N.Y.	15	-----	---------	---------	---------	48	7:20 p.m.	73	7:25p	.32	
Poughkeepsie, N.Y., CAA	15	-----	---------	---------	---------	-------	---------	54	8:25p	.39	
Syracuse, N.Y., WBAS	15	-----	---------	56 SE	9:50 p.m.	63	9:52 p.m.	75 ESE	9:53p	.04	Center passed to north. Wind shifted to SSW
Stewart AFB, Newburgh, N.Y.	15	-----	---------	---------	---------	-------	---------	67	7:36p	.71	
Westchester County Airport, N.Y.	15	-----	---------	---------	---------	-------	---------	70	7:40p	.03	
Utica, N.Y., CAA	15	-----	---------	---------	---------	54	9:06 p.m.	78	9:06p	-----	
Rochester, N.Y., WBAS	15	-----	---------	45	10:30 p.m.	47	10:32 p.m.	54	6:10p	.65	
Watertown, N.Y.	15	-----	---------	---------	---------	55	10:10 p.m.	80	12:08a	-----	
Bridgeport, Conn., WBAS	15	-----	---------	---------	---------	40 SE	8:28 p.m.	60 SE	8:28p	1.77	
Hartford, Conn., WBAS (Bradley Field)	15	-----	---------	40	8:52 p.m.	44 SE	8:52 p.m.	65	8:55& 9:25p	.38	
New Haven, Conn., WBAS	15	-----	---------	37 SE	9:10 p.m.	47 SE	9:10 p.m.	57	9:05p	.50	
Stanford, Conn.	15	29.53	8:00 p.m.	---------	---------	-------	---------	68	-----	.33	
Block Island, R.I., WBAS	15	-----	---------	---------	---------	48	11:40 p.m.	55	11:59p	.45	
Providence, R.I., WBAS	16	-----	---------	---------	---------	41 SE	0:13 a.m.	59 SE	0:21a	.46	
Blue Hill, Mass.	15-16	-----	---------	---------	---------	54 SSE	(16th)	68 S	-----	.98	
Boston, Mass., WBO	15-16	29.70	2:28 a.m. (16th)	---------	---------	36 SE	10:24 p.m. (15th)	41 SE	10:45p (15th)	1.35	
Nantucket, Mass., WBAS	15-16	-----	---------	31	1:17 a.m. (16th)	36 SE (15th)	10:13 p.m.	40	10:28p	.11	
Pittsfield, Mass.	15	-----	---------	---------	---------	55	---------	-----	-----	.45	
Worcester, Mass.	15-16	-----	---------	---------	---------	25	11:09 p.m.	39	11:09p	-----	
Concord, N.H., WBAS	15	-----	---------	28	9:33 p.m.	30 SE	9:34 p.m.	39	9:29p	1.13	
Lebanon, N.H.	15	-----	---------	---------	---------	29	11:28 p.m.	49	11:28p	-----	
Manchester, N.H.	15-16	29.68	2:27 a.m. (16th)	---------	---------	23 SSE	10:28 p.m. (15th)	41	11:27p (15th)	1.12	
Mt. Washington, N.H.	15	-----	---------	---------	---------	76	9:20 p.m.	110	8:29p	-----	
Burlington, Vt., WBAS	15	-----	---------	50	11:25 p.m.	70 SE	11:49 p.m.	74	11:25p	-----	
Montpelier, Vt.	15	-----	---------	---------	---------	23	11:29 p.m.	40	11:29p	.04	
Augusta, Me.	16	-----	---------	---------	---------	40	4:28 a.m.	54	4:28a	-----	
Houlton, Me.	16	-----	---------	---------	---------	22	10:28 a.m.	30	11:28a	-----	
Portland, Me., WBAS	16	-----	---------	39	5:51 a.m.	44 SE	6:00 a.m.	56	4:46a	.67	

xx Several times between 9 and 10 a.m.
* Estimated
= Estimated by watching the dial
** Observed on the dial
% Reported by fishing boat "Judy Ninda" at Tilghman Point while in the eye of the storm. Aneroid compared at Wilmington and found reasonably accurate.

WBO indicates Weather Bureau Office; WBAS, weather Bureau Airport; NAS, Naval Air Station; CAA, Civil Aeronautics Administration; U.S.C.G., U.S. Coast Guard.

Table 18a

HURRICANES AND TROPICAL DISTURBANCES

(Names of storms in table correspond to names of tracks on chart at end of publication)

YEAR 1954

Storm name	Date	Area where first reported	Coast lines crossed	Highest wind speed reported	Lowest pressure reported	Place of dissipation reported	Intensity	Remarks
ALICE	June 24-26	West Gulf of Mexico	Mexico	70-80 m.p.h., estimated.		Over southwest Texas	Hurricane	Damage estimates not available. 17 deaths in Texas.
BARBARA	July 28-29	150 miles southwest of New Orleans	Louisiana	60 m.p.h., off Ship Shoals		In vicinity of Waco, Tex.	Less than hurricane	Damage estimates not available.
CAROL	Aug.26-31	East of northern portion of the Bahama Islands	Long Island southeast Conn.	135 m.p.h. in gusts at Block Island	28.50 in.	Quebec, Canada	Hurricane	Damage estimated at $461,027,500, of which $6,000,000 was in New York, $250,000 in New Jersey, and $227,500 in North Carolina. Remainder in New England. There were 60 deaths in the Long Island-New England area and 1,000 injuries.
DOLLY	Sept. 1-2	Near latitude 26° N., longitude 69° W.	None	100-115 m.p.h., estimated		East of Nova Scotia	Hurricane	Did not reach any land area.
EDNA	Sept.6-11	About 60 miles east of Turks Island	Eastern Massachusetts; eastern Maine	120 m.p.h. in gusts at Martha's Vineyard, Mass.	27.77 in.	New Brunswick, Canada	Hurricane	Damage estimated at $42,815,000. Twenty-one deaths in New Jersey and New England.
FLORENCE	Sept. 11-12	In southwestern Gulf of Mexico	Mexico	65 m.p.h.		Near Tuxpan, Mexico	Probably hurricane	$1,500,000 damage and 5 deaths in Mexico.
GILDA	Sept. 25-27	In Caribbean Sea east of Cape Gracias, Nicaragua	British Honduras	60-70 m.p.h. in squalls		In eastern British Honduras	Less than hurricane	Damage estimates not available.
HAZEL	Oct.5-16	South of Barbados, Windward Islands	Haiti and at N.C.-S.C. border	150 m.p.h. in gusts, estimated.	27.70 in. at Little River, N.C.	See note under "Remarks"	Hurricane	Was traced on through north Atlantic to north of Sweden. Damage in United States estimated at $251,630,000; in Canada, $100,000,000; in Grenadine Islands, $42,500,000; in Haiti, several millions; in Bahamas minor. There were 95 deaths in the United States, 78 in Canada, 6 in the Bahamas, and 400-1,000 in Haiti.

NORTH ATLANTIC HURRICANES AND TROPICAL DISTURBANCES FOR PAST YEARS

Table 19.- Frequency of tropical storms by month and season and number of storms reaching hurricane intensity

	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1922									
Number of tropical storms	0	1	0	0	2	2	0	0	5
Number of hurricanes	0	0	0	0	1	1	0	0	2
1923									
Number of tropical storms	0	0	0	0	2	3	0	0	5
Number of hurricanes	0	0	0	0	1	1	0	0	2
1924									
Number of tropical storms	0	1	0	2	2	2	1	0	8
Number of hurricanes	0	0	0	2	1	1	0	0	4
1925									
Number of tropical storms	0	0	0	1	1	0	0	1	3
Number of hurricanes	0	0	0	0	0	0	0	1	1
1926									
Number of tropical storms	0	0	1	2	5	1	1	0	10
Number of hurricanes	0	0	1	2	3	1	0	0	7
1927									
Number of tropical storms	0	0	0	1	3	2	1	0	7
Number of hurricanes	0	0	0	1	1	0	0	0	2
1928									
Number of tropical storms	0	0	0	2	3	1	0	0	6
Number of hurricanes	0	0	0	1	1	1	0	0	3
1929									
Number of tropical storms	0	1	0	0	1	0	0	0	2
Number of hurricanes	0	1	0	0	1	0	0	0	2
1930									
Number of tropical storms	0	0	0	1	1	0	0	0	2
Number of hurricanes	0	0	0	1	1	0	0	0	2
1931									
Number of tropical storms	0	1	1	1	3	1	1	0	8
Number of hurricanes	0	0	0	0	2	0	0	0	2
1932									
Number of tropical storms	1	0	0	2	4	2	2	0	11
Number of hurricanes	0	0	0	2	2	0	2	0	6
1933									
Number of tropical storms	1	1	3	6	6	3	1	0	21
Number of hurricanes	0	1	1	2	4	2	0	0	10
1934									
Number of tropical storms	1	1	1	2	2	3	1	0	11
Number of hurricanes	0	1	0	1	1	1	1	0	5
1935									
Number of tropical storms	0	0	0	1	2	1	1	0	5
Number of hurricanes	0	0	0	1	2	1	1	0	5
1936									
Number of tropical storms	0	3	2	6	5	1	0	0	17
Number of hurricanes	0	1	1	1	2	0	0	0	5
1937									
Number of tropical storms	0	0	1	2	5	1	0	0	9
Number of hurricanes	0	0	0	0	2	0	0	0	2
1938									
Number of tropical storms	0	0	0	3	1	3	1	0	8
Number of hurricanes	0	0	0	3	1	0	0	0	4
1939									
Number of tropical storms	0	1	0	1	1	1	1	0	5
Number of hurricanes	0	0	0	0	0	1	1	0	2
1940									
Number of tropical storms	1	0	0	3	2	2	0	0	8
Number of hurricanes	0	0	0	3	1	0	0	0	4
1941									
Number of tropical storms	0	0	0	0	4	2	0	0	6
Number of hurricanes	0	0	0	0	3	1	0	0	4
1942									
Number of tropical storms	0	0	0	3	1	3	1	0	8
Number of hurricanes	0	0	0	1	0	0	1	0	2
1943									
Number of tropical storms	0	0	1	2	4	3	0	0	10
Number of hurricanes	0	0	1	1	2	1	0	0	5
1944									
Number of tropical storms	0	0	2	3	3	2	0	0	10
Number of hurricanes	0	0	1	2	2	1	0	0	6
1945									
Number of tropical storms	0	1	1	4	3	1	0	0	10
Number of hurricanes	0	1	0	1	1	1	0	0	4
1946									
Number of tropical storms	0	1	1	1	1	1	1	0	6
Number of hurricanes	0	0	0	0	1	1	0	0	2
1947									
Number of tropical storms	0	0	1	3	3	3	0	0	10
Number of hurricanes	0	0	0	1	1	2	0	0	4

Table 19.- Frequency of tropical storms by month and season and number of (Cont'd.) storms reaching hurricane intensity

	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1948									
Number of tropical storms	2	0	1	2	3	1	1	0	10
Number of hurricanes	0	0	0	1	3	1	0	0	5
1949									
Number of tropical storms	0	0	0	3	5	2	1	0	11
Number of hurricanes	0	0	0	2	3	2	1	0	8
1950									
Number of tropical storms	0	0	0	3	3	6	0	0	12
Number of hurricanes	0	0	0	3	3	5	0	0	11
1951									
Number of tropical storms	1	0	0	2	4	3	0	0	10
Number of hurricanes	1	0	0	1	3	3	0	0	8
1952									
Number of tropical storms	0	0	0	1	3	2	0	0	6
Number of hurricanes	0	0	0	1	3	2	0	0	6
1953									
Number of tropical storms	1	0	0	1	4	2	0	0	8
Number of hurricanes	0	0	0	1	4	0	0	0	5
1954									
Number of tropical storms	0	1	1	1	4	1	0	0	8
Number of hurricanes	0	1	0	1	3	1	0	0	6

Table 19a.--Total number of tropical storms by month and season and number reaching hurricane intensity for period 1887 to

	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1887 to 1954									
Number of tropical storms	9	27	32	98	176	128	32	3	505
Number of hurricanes	1	11	15	61	109	53	8	1	259

Storms are listed under the month in which they ran most of their course.

Table 19b.--Total number of tropical storms and loss of life and damage in the United States, 1915-1941

Year	Total number of occurrences	Number reaching United States Coast	Loss of life in United States	Damage in United States
1915	5	2	550	$ 63,000,000
1916	13	3	107	33,324,000
1917	2	1	5	170,000
1918	4	1	34	5,000,000
1919	4	1	287	22,000,000
1920	4	2	2	3,000,000
1921	5	1	5	3,000,000
1922	5	0	0	0
1923	5	1	0	19,300
1924	8	1	2	Minor
1925	3	1	8	Minor
1926	10	3	289	106,500,000
1927	7	0	0	0
1928	6	3	1,838	25,000,000
1929	2	2	3	653,000
1930	2	1	0	Negligible
1931	8	3	0	0
1932	11	5	0	0
1933	21	5	63	45,650,000
1934	11	4	17	4,760,000
1935	5	2	414	11,500,000
1936	17	6	9	2,300,000
1937	9	5	0	42,500
1938	8	4	600	300,245,000
1939	5	3	3	2,000
1940	8	2	51	4,743,550
1941	6	4	10	7,675,000
Total	194	66	4,273	---
Median	6	2	---	---

Table 19c.- Total number, loss of life, and damage in all areas, and in the United States

Year	Total number		Loss of Life		Damage	
	In all areas	Reaching U.S. Coast	Total all areas	In United States	Total all areas	In United States
1942	8	3	17	8	$ 31,101,000	$ 27,101,000
1943	10	4	19	16	16,765,000	16,765,000
1944	10	4	1,076	64	202,010,000*	165,010,000
1945	10	5	29	7	80,133,000*	80,133,000
1946	6	4	5	0	5,200,000*	5,200,000
1947	10	8	72	53	135,757,500	135,757,500
1948	10	5	24	3	24,400,000*	18,400,000
1949	11	3	4	4	59,762,000	58,750,000
1950	12	4	27	19	36,925,000*	35,850,000
1951	10	1	244	0	25,045,000*	2,000,000
1952	6	1	16	3	3,750,000*	2,750,000
1953	8	4	3	2	6,162,500*	6,162,500
1954	8	5	720+	193	857,015,000*	755,472,500*
Total	119	51	2,256	372	$1,484,026,000	$1,309,351,500
Median	10	4	---	---	---	---

* Considerable additional damage for which figures are not available.

# Loss of life and damage not available outside of United States prior to 1942.

EASTERN NORTH PACIFIC HURRICANES AND TROPICAL DISTURBANCES, 1954

Compiled by L. B. Rasey
Weather Bureau Airport Station
San Francisco, California

During the period from late June to early November 1954, ten well developed tropical storms were charted off the west coast of Mexico. Of this number, four were believed to have reached hurricane force (75 m.p.h. or more). In the northeast Pacific Ocean the average number of tropical storms is 6 and the average reaching hurricane force is 2.4.

Four of the storms moved across the Mexican coast line in a northerly direction and six progressed westward into an area where there is little shipping. Lack of reports in this area (at times no reports were received for periods in excess of 24 hours) made it difficult to track the storms and in addition some may have intensified to hurricane strength undetected. The 10 storm tracks presented here were smoothed in the light of all reports.

Special advisories were issued on all storms that were believed to be intensifying to Beaufort force 7 (32 m.p.h.) or greater. The San Francisco forecast center of the U. S. Weather Bureau issued 147 advisories, a few of which discussed more than one storm. The Los Angeles office issued one advisory and the Honolulu office 3 advisories on storms which moved into their respective areas of responsibility. One of the San Francisco advisories gave warning of an area of strong squalls although no organized circulation developed.

All storms were between latitudes 11° and 20° north when first discovered and only one could be traced north of 25° north latitude.

No information has been received concerning damage to property or loss of life as a result of these storms.

A synopsis of the important features of these storms is given in the accompanying Table 18a. In the table and the following discussion of individual storms Pacific standard time is used.

I. Tropical Disturbance of June 17-19.--On June 17, 1954, at 1630 p.s.t. the ship Santa Rosa at latitude 14.7° north, longitude 93.8° west reported the wind southeast Beaufort force 6 (30 m.p.h.) and the barometer 1006.0 millibars (29.71 inches). This report, along with others, indicated a closed circulation was developing about 150 miles southwest of Tapachula, Mexico. This storm was traced northwestward at about 6 knots. The first advisory was issued at 0700 p.s.t., June 18, indicating winds of 30 to 40 m.p.h. around a center located near latitude 14° north, longitude 95° west. At 1030 p.s.t. on the 18th the center was fixed near latitude 14.2° north, longitude 95.5° west by the Kamogawa Maru which apparently passed near the center of the storm. Her wind shifted from northwest force 3 to south-southwest force 8 in one hour, 1000 p.s.t. to 1100 p.s.t. The strongest wind was reported at 2230 p.s.t., June 19, by the Trondanger at 14.7° north, 96.1° west, wind force 9 (50 m.p.h.) from the north. The lowest pressure, 999.8 millibars (29.52 inches) was reported by the Trondanger at this time and also by the Duivendyk at latitude 17.7° north, longitude 95.9° west at the same hour. The Duivendyk's wind was southeast force 8 (43 m.p.h.).

The center of the storm moved inland between Salina Cruz and Acapulco, Mex., at about latitude 16° north, longitude 97.5° west, June 19, 1630 p.s.t. Although an area of strong squalls progressed rapidly northwestward along the coast, no well defined center could be detected in this squally area. On June 21 at 0730 p.s.t., the Eclipse at latitude 17.6° north, longitude 102.7° west reported wind force 6, pressure 1002.7 millibars (29.61 inches), rough seas, rapid pressure rise and a shift in the wind from northeast to southeast in the past 2 hours. This was the last significant report in connection with the storm and its subsequent area of squalls.

II. Tropical Disturbance of July 10-16.--A cyclonic circulation was suspected to be developing near latitude 15° north, longitude 105° west on July 10 at 0430 p.s.t. Meager reports indicated a northwestward movement around 20 knots through the 11th and then a curving track towards the southwest by the 15th. During this period ships within 75 to 100 miles of the center reported winds of only Beaufort force 4 or 5 but winds near the center may have been stronger. At 1030 p.s.t., July 15, the Burco Trader, at latitude 16.3° north, longitude 120.2° west, reported an east-southeast wind force 8 (44 m.p.h.) and pressure of 1007.1 millibars (29.74 inches) which was the strongest wind and lowest pressure actually reported in connection with this storm. On July 16, 0430 p.s.t., the center was believed near latitude 14.8° north, longitude 122.8° west, moving southwestward and weakening. No further information was received on the storm.

III. Hurricane of July 12-17.--A weak cyclonic circulation was noted south of the Gulf of Tehuantepec at 0430 p.s.t., July 12, at latitude 13.9° north, longitude 95.0° west. This low pressure center moved westward at 10 knots with increasing strength. By 1030 p.s.t. of the 12th the Madaket, at latitude 14.0° north, longitude 94.7° west, reported the wind east-southeast force 6 and at 1030 p.s.t., July 13, the Kulukundis, at latitude 14.6° north, longitude 97.2° west, was encountering a southeast wind force 8 (44 m.p.h.). Advisories were issued beginning at 1300 p.s.t., July 12, and winds were estimated at 50 m.p.h. near the center. On the 14th at 1030 p.s.t. the Kulukundis observed an east wind force 9 (50 m.p.h.). On the night of the 14th the storm curved northwestward and accelerated and on the 15th it was making 21 knots in a northwesterly direction, parallel to the Mexican coast, being located at latitude 18.4° north, longitude 107.4°west at 1630 p.s.t. By 1030 p.s.t. on the 16th the storm, now increased to hurricane strength, was moving north-northwestward about 125 miles south of the southern tip of Baja California, Mexico, and the Flying Trader at latitude 21.0° north, longitude 108.1° west, reported a south wind of 87 m.p.h. The lowest pressure reported during the storm was by the Flying Trader at 0730 p.s.t. on the 16th at latitude 21.0° north, longitude 109.8° west, 990.9 millibars (29.26 inches). During the night of the 16th and on the 17th the storm moved along the west coast of Baja California and weakened rapidly. The last advisory was issued by the Los Angeles Weather Bureau Office on the evening of July 17 as the storm passed through the Ballenas Bay on the west coast of Baja California, Mexico.

IV. Hurricane of July 25-August 2.--The first indication of a new storm forming was the weather report from the motor vessel Southern Pacific at 0900 p.s.t., July 25, located near latitude 18.3°

north, and longitude 114.7° west. The wind was northwest force 9 (50 m.p.h.) and the pressure 1007.5 millibars (29.75 inches). The storm center was judged to be near latitude 18.8° north, and longitude 112.9° west. By evening the Southern Pacific was east of the storm center and the wind was decreasing. No further reports were received in that area for 24 hours but the disturbance was believed to be drifting westward. At 1030 p.s.t., July 26, the Stanvac Nairobi, at latitude 17° north, longitude 122° west, reported squalls, a northeast wind force 5 (22 m.p.h.) and barometer 1011.0 millibars (29.85 inches). By evening the Nairobi had steamed one degree northward and the wind had increased to northeast force 6 (28 m.p.h.). From this evidence the storm center was estimated to be moving westward some distance to the south of the Nairobi. The next report on this storm was received 4 days later from the Steel Apprentice at 1630 p.s.t., July 30, located at latitude 19.2° north, longitude 126.6° west. The wind was north-northeast force 5. By 0600 p.s.t., July 31, the Steel Apprentice, now at latitude 19.0° north, longitude 126.5° west, reported a northeast wind force 11 (70 m.p.h.) and barometer 995.9 millibars (29.40 inches). This was the highest wind and the lowest barometer reading reported. The storm center was believed to be near latitude 19.0° north, longitude 126.3° west at 0430 p.s.t. on the 31st. The Steel Apprentice, steaming eastward had a southeast wind force 3 by evening. The Hawaiian Citizen, moving eastward near latitude 18° north, from longitude 138° to 132° west during the period August 1 to 3, found no unusual weather, indicating the storm had curved southwestward and was weakening.

V. Tropical Disturbance of September 1-8.--This storm, from point of origin to its last known position, pursued a course farther west than any of the 10 storms. It was first discovered when the Steel Advocate, at latitude 17° north, longitude 115.5° west, 1030 p.s.t., Sept. 1, reported an east wind force 6 (28 m.p.h.) and barometer 1009.8 millibars (29.82 inches). The center was then estimated near latitude 16.5° north, longitude 115.9° west and it may have existed earlier. The storm moved in a general westerly direction at 15 knots. At 1030 p.s.t., Sept. 2, the Joseph Lykes, at latitude 18.6° north, longitude 123.7° west, reported the strongest wind observed for this storm, north-northeast force 7 (35 m.p.h.). On Sept. 4 at 0430 p.s.t., the Buckeye State passed through the eye of the storm near latitude 16.9° north, longitude 131.9° west but did not report the storm intensity. From this fact and succeeding reports of only force 4 and 5 wind, the storm was judged to be mild. After passing the position indicated by the Buckeye State the center curved northwestward and the lowest pressure report was received from the Hawaiian Educator, Sept. 5 at 2230 p.s.t., 1004.7 millibars (29.67 inches). The storm then curved westward and by the evening of the 8th, it was dissipating near latitude 21.3° north, longitude 146.0° west.

VI. Tropical Disturbance of September 14-21.--The sixth storm of the season was particularly interesting because it was believed to be related to a tropical storm which moved westward in the Gulf of Mexico. On the morning of Sept. 12, a weak tropical storm moved inland in the vicinity of Tuxpan on the east coast of Mexico. The first indication of a storm in the Pacific was the report from the Putoro at latitude 18.8° north, longitude 104.0° west, 1630 p.s.t., Sept. 14. The wind was southeast force 6 (28 m.p.h.). Other observations during the night of the 14th indicated a closed circulation. During the 15th and 16th the storm moved northwestward 7 or 8 knots. The lowest pressure, 997 millibars (29.44 inches), received from surface vessels occurred at 0430 p.s.t., Sept. 16, and was reported by the Ryuzan at latitude 22.0° north, longitude 109.3° west, while the strongest wind, force 9 (50 m.p.h.) was observed by the Moldanger at latitude 22.8° north, longitude 109.5° west at 2230 p.s.t. on the 16th. The storm reached latitude 22.8° north, longitude 112.2° west on the morning of the 17th and then curved west-southwestward. Reconnaissance aircraft from McClelland Air Force Base near Sacramento, Calif., established the storm center at latitude 21.0° north, longitude 117.0° west at 1525 p.s.t., Sept. 18. The air reconnaissance found that the "eye" of the storm was approximately 3 miles in diameter and a dropsonde observation indicated a central pressure of 981 millibars (28.97 inches). This was the lowest reported pressure for any of the 10 storms. Unfortunately, no confirmation by direct surface observation was received and surface winds at this time were also unreported.

No further observations near the disturbance were received but the general analysis indicated the storm moved westward to the vicinity of latitude 20.0° north, longitude 125.0° west by the morning of Sept. 21 before dissipating.

VII. Tropical Disturbance of September 20-27.--The 6th and 7th storms of the season, beginning 5 days apart, followed almost identical paths, indicating a continuation of the general circulation pattern. The center of the 7th storm was first discovered on the afternoon of Sept. 20 near latitude 17.0° north, longitude 104.0° west. At 1630 p.s.t. the Comayagua at latitude 17.5° north, longitude 101.9° west observed the wind southeast force 7 (35 m.p.h.) and the pressure 1007.8 millibars (29.76 inches). The storm progressed in a general northwest direction at about 8 knots to latitude 21.8° north, longitude 113.3° west at 1630 p.s.t., Sept. 23, and then curved west-southwestward, dissipating near latitude 18.8° north, longitude 123.3° west on the 27th. The strongest wind reported was force 9 (50 m.p.h.) observed by the Lake Kootenay, 0430 p.s.t., Sept. 21, at latitude 18.8° north, longitude 104.3° west. A low pressure of 1003.9 millibars (29.65 inches) was reported by the Tomaha, 0430 p.s.t., Sept. 23, at latitude 23.0° north, longitude 110.3° west.

VIII. Hurricane of Sept. 26-30.--The eighth storm of the season was first noted in the Gulf of Tehuantepec at 1030 p.s.t., Sept. 26. The Hawaiian Educator, at latitude 13.8° north, longitude 94.9° west, reported a south-southwest wind force 7 (35 m.p.h.) and barometer 1008.1 millibars (29.77 inches). The storm center was estimated to be at latitude 13.9° north, longitude 95.1° west. This disturbance curved southwestward at 16 knots. Winds of force 5 to 7 were reported over a rather large area around the storm during the 27th. On the morning of the 28th the Panamanian S.S. Elga, at latitude 11.9° north, longitude 97.8° west, reported a south wind force 8 (43 m.p.h.) at 0430 p.s.t. and the storm center was believed near latitude 12.3° north, longitude

EASTERN NORTH PACIFIC HURRICANES AND TROPICAL DISTURBANCES, 1954—Continued

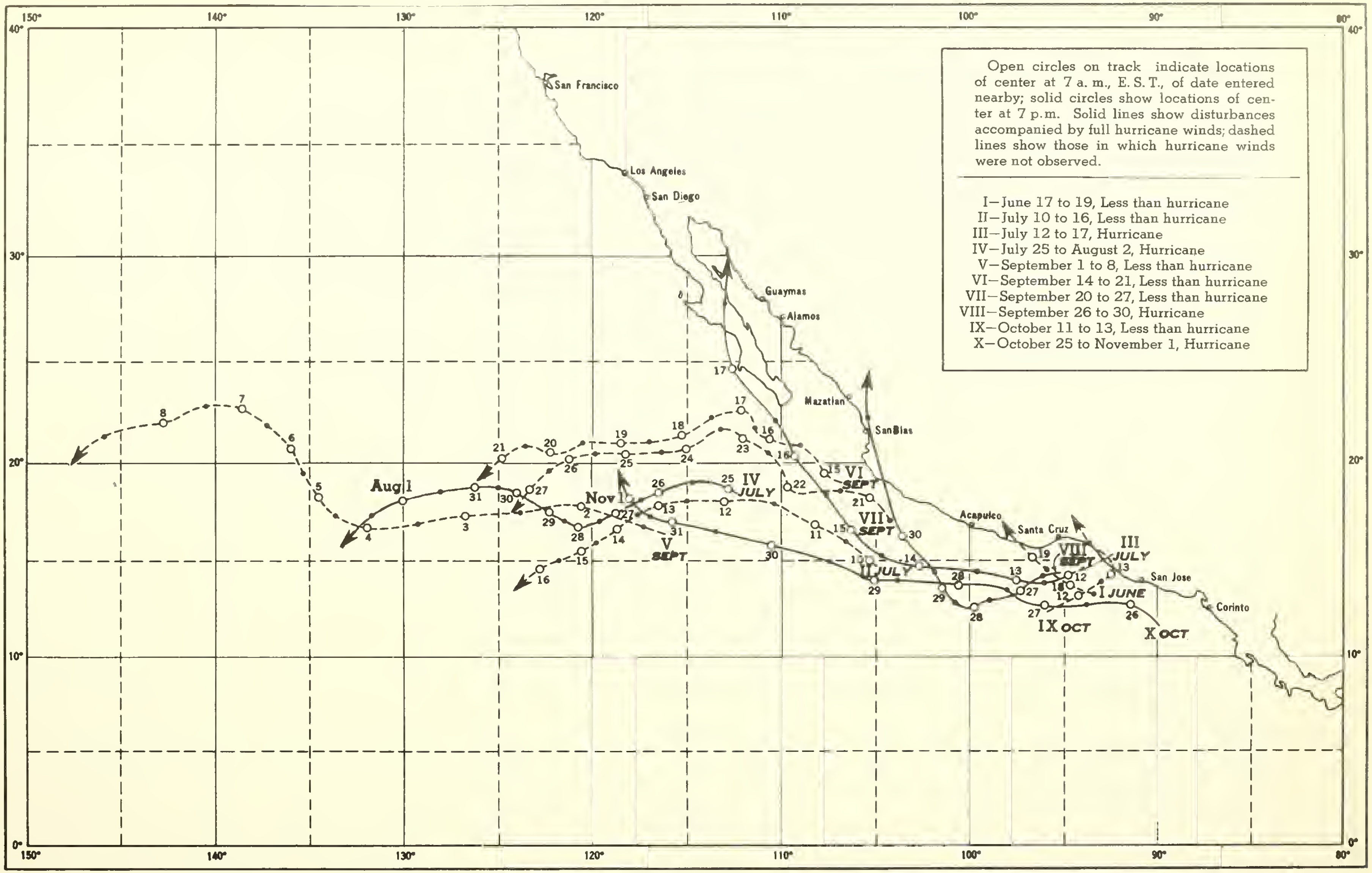
99.8° west. The *Elga*, steaming slowly westward continued to experience force 8 winds until 0430 p.s.t. on the 29th when she reported force 10 (60 m.p.h.) at latitude 12.6° north, longitude 101.2° west. She encountered force 9 and 10 winds through the 29th. Despite these strong winds, reports of increasing easterly winds some 200 miles to the north led to the conclusion that the storm center was curving northwestward and increasing in size and strength. At 1630 p.s.t., Sept. 29, the center was near latitude 14.6° north, longitude 102.0° west and accelerating in a north-northwest direction. During the night of the 29th the storm appeared to be affecting an area some 250 to 300 miles in radius and it is quite likely winds near the center reached hurricane force although no reports close to the center were available to confirm this belief. Easterly winds of force 8 were reported near the Mexican coast in the vicinity of Manzanillo early on the 30th. The storm was near latitude 17.0° north, longitude 104.0° west at 0430 p.s.t., Sept. 30, and moving northward about 20 knots and still accelerating. Around noon these easterly gales off Manzanillo shifted to west and the storm was believed moving inland just north of Manzanillo. Squally weather continued for about a day over a large area recently traversed by the storm. Rain fell in northern Mexico on Nov. 2 and showers occurred from Arizona to Texas on November 2 and 3.

The *Elga* reported the highest wind for this storm, force 10, on several occasions as mentioned above. The lowest pressure was 1000 millibars (29.53 inches) reported by the *George Luckenbach* near latitude 19.2° north, longitude 105.0° west at 1300 p.s.t., Sept. 30.

IX. *Tropical Disturbance of October 11-13.*--The ninth storm of the season was unusual in that it moved in a northeasterly direction in the Gulf of Tehuantepec for the first 30 hours of its life. There was evidence that a closed circulation developed at 2230 p.s.t., Oct. 11, near latitude 12.9° north, longitude 95.1° west. At 0430 p.s.t., Oct. 12, the *California* at latitude 13.0° north, longitude 95.6° west reported a north wind force 9 (50 m.p.h.) and a barometer 1000 millibars (29.53 inches). By 1030 p.s.t. the *California* was experiencing a southwest wind force 10 (60 m.p.h.), the strongest winds for the storm. The center of the disturbance was near latitude 13.5° north, longitude 93.4° west at this time and was moving northeastward about 7 knots. The lowest pressure, 999 millibars (29.50 inches), was reported by the *Duivendyk* at latitude 13.4° north, longitude 93.4° west, 2230 p.s.t., Oct. 12. At 0430 p.s.t., Oct. 13, the center was near latitude 14.0° north, longitude 92.5° west, moving very slowly and curving northwestward. The storm moved inland during the evening of the 13th about 60 miles east of Salina Cruz, Mexico. Hurricane force winds were not achieved by this storm but speeds as high as 70 m.p.h. probably occurred near the center.

X. *Hurricane of October 25-November 1.*--The last storm of the season developed near latitude 11.8° north, longitude 89.9° west, Oct. 25, about 1630 p.s.t. and moved steadily westward, averaging around 12 knots. Winds around the center increased rapidly during the 26th and by 2230 p.s.t. the *City of Bedford*, at latitude 12.7° north, longitude 94.3° west, reported the strongest wind for the storm, south-southwest force 11 (70 m.p.h.). The pressure was 999.9 millibars (29.53 inches). Hurricane winds were believed to exist near the center. Winds of force 8 to 10 continued to be reported around this storm through the 27th and 28th. A ship designated at *NQ* reported the lowest barometer reading, 984.8 millibars (29.08 inches), at 1930 p.s.t., Oct. 27, at latitude 13.6° north, longitude 96.3° west. From around noon of the 28th to late on the 30th only one ship report was received in the vicinity of this storm. However, at 1930 p.s.t., Oct. 30, the *Haihuang*, at latitude 16.0° north, longitude 114.2° west, reported a north wind force 8 (44 m.p.h.), pressure 1008.8 (29.79 inches), pressure falling rapidly and very rough seas. On the evening of the 31st the storm was curving northwestward and by the evening of Nov. 1, it was believed to be dissipating near latitude 19.0° north, longitude 118.5° west.

EASTERN NORTH PACIFIC HURRICANES AND TROPICAL DISTURBANCES, 1954



Open circles on track indicate locations of center at 7 a. m., E. S. T., of date entered nearby; solid circles show locations of center at 7 p.m. Solid lines show disturbances accompanied by full hurricane winds; dashed lines show those in which hurricane winds were not observed.

I—June 17 to 19, Less than hurricane
II—July 10 to 16, Less than hurricane
III—July 12 to 17, Hurricane
IV—July 25 to August 2, Hurricane
V—September 1 to 8, Less than hurricane
VI—September 14 to 21, Less than hurricane
VII—September 20 to 27, Less than hurricane
VIII—September 26 to 30, Hurricane
IX—October 11 to 13, Less than hurricane
X—October 25 to November 1, Hurricane

Table 18a

HURRICANES AND TROPICAL DISTURBANCES

(Number of storms in table corresponds to number of tracks on chart at end of publication)

YEAR 1954

Storm number	Date	Area where first reported	Coast lines crossed	Highest wind speed reported	Lowest pressure reported	Place of dissipation reported	Intensity	Remarks
I	June 17-19	Latitude 13.4° N., longitude 93.5° W., or about 150 miles southwest of Tapachula, Mexico	Mexico between Salina Cruz and Acapulco	50 m.p.h. by the Trondanger 10:30 p.m., p.s.t. June 19 latitude 14.7° N., longitude 96.1° W.	29.52 inches on 19th	*In southern Mexico	Not of hurricane intensity	*An area of strong squalls progressed rapidly northwestward along the coast subsequent to the storm's passage inland. No damage reported.
II	July 10-16	Latitude 15° N., longitude 105° W., or 280 miles south-southwest of Manzanillo, Mexico	None	44 m.p.h. by the Burco Trader 10:30 a.m., July 15; latitude 16.3° N., longitude 120.2° W.	29.74 inches on 15th	near latitude 14.8°N., longitude 122.8°W.	Not of hurricane intensity	No land areas affected.
III	July 12-17	Latitude 13.9° N., longitude 95.0° W., or 140 miles south of Salina Cruz, Mexico	Baja California, Mexico, near Ballenas Bay	87 m.p.h. by the Flying Trader 10:30 a.m., July 16; latitude 21.0° N., longitude 108.1° W.	29.26 inches by Flying Trader 7:30 a.m., July 16; latitude 21.0°N., longitude 109.8°W.	Gulf of California	Hurricane	No damage reported.
IV	July 25-Aug. 2	Latitude 18.8° N., longitude 112.9° W., or 140 miles west of Socorro Island off Mexico	None	70 m.p.h. by the Steel Apprentice, 6:00 a.m., July 31; latitude 19.0° N., longitude 126.5° W.	29.40 inches on 31st	Latitude 16.5°N; longitude 132.6°W.	Hurricane	No land area affected.
V	Sept. 1-8	Latitude 16.5° N., longitude 115.9° W., or 350 miles west of Socorro Island	None	35 m.p.h., by the Joseph Lykes, 10:30 a.m., Sept. 2; latitude 18.6° N., longitude 123.7° W.	29.67 inches by the Hawaiian Educator, 10:30 p.m., Sept. 5	Near latitude 21.3°N., longitude 146.8°W.	Not of hurricane intensity	No land area affected.
VI	Sept. 14-21	Latitude 19.0° N., longitude 107.0° W., or 200 miles west of Manzanillo, Mexico	None	50 m.p.h., by the Moldanger, 10:30 p.m., 16th, at 22.8° N., 109.5° W.	28.97 inches by dropsonde on 18th. 29.44 by ship, on 16th	Near latitude 20.0°N., Longitude 125.0°W.	Not of hurricane intensity	No land area affected.
VII	Sept. 20-27	Near latitude 17.0° N., longitude 104.0° W., or 140 miles south of Manzanillo, Mexico	None	50 m.p.h., by the Lake Kootenay, 4:30 a.m., Sept. 21; latitude 18.8° N., longitude 104.3° W.	29.65 inches by the Tomaha, 4:30 a.m., Sept. 23; latitude 23.0°N., longitude 110.3°W.	Near latitude 18.8°N., longitude 123.3°W.	Not of hurricane intensity	No land area affected.
VIII	Sept. 26-30	Latitude 13.9° N., longitude 95.1° W., or 120 miles south of Salina Cruz, Mexico	Mexico, just north of Manzanillo	No reports close to the center available. 60 m.p.h. reported by the Elga, 4:30 a.m., 29th, at 12.6° N., 101.2° W., and on several other occasions.	29.53 inches by the George Luckenback, 1:00 p.m. 30th; near 19.2°N., 105.0°W.	North of Manzanillo, Mexico	Hurricane	No damage reported. Showers occurred from Arizona to Texas on Nov. 2 and 3.
IX	Oct. 11-13	Near latitude 12.9° N., longitude 95.1° W., or 220 miles south of Salina Cruz, Mexico	Mexico, 60 miles east of Salina Cruz	60 m.p.h. by the California, 10:30 a.m., 12th, when center was near 13.5° N., 93.4° W.	29.50 inches by the Duivendyk at 13.4° N., 93.4° W., 10:30 p.m. Oct. 12	North of Salina Cruz, Mexico	Not of hurricane intensity. Though it probably reached 70 m.p.h.	No damage reported.
X	Oct. 25-Nov. 1	Near latitude 11.8° N., longitude 89.9° W.	None	70 m.p.h. by the City of Bedford, 10:30 p.m., 26th, at 12.7° N., 94.3° W. Hurricane winds believed to exist near the center.	29.08 inches by ship NQ, 7:30 p.m. 27th, at 13.6°N., 96.3°W.	About 500 miles west of Socorro Island	Hurricane	No land area affected.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

YEAR 1954

The severe floods in northern Iowa and southern Texas during June were the most damaging and widespread to be reported during 1954. These floods produced record to near-record stages in the Des Moines, Rock, Little Sioux, and Big Sioux River Basins in Iowa and the greatest flood of record in the Rio Grande from the mouth of the Pecos to Falcon Reservoir. Damages to growing crops were heavy in Iowa. Two lives were lost in the Iowa flood, while in Texas at least 16 lives were lost. On the Mexican side of the Rio Grande there was a considerably greater loss of life.

The most significant flooding during January 1954 occurred in streams along the California coast. The Russian River reached its highest stage at Guerneville since February 1940, and at Healdsburg since January 1943. Two major floods were reported on the Eel River at Fernbridge, Calif. Considerable damage was reported from flash floods in northern Alabama; the Flint River reached the highest stage in its history in the upper portion; the Tar and Neuse Rivers in eastern North Carolina reached their highest stages since 1945.

There were no major or significant floods during February. All the overflows reported were generally light or minor. The ice on the Missouri River broke up about 3 weeks earlier this year than normal, and in the 99 years of record the ice has broken up earlier only 5 times. Record low stages were reached on the Scioto River in Ohio.

Flooding in March was mostly light or minor. The Scioto River reached a new record low during the month.

There was no significant flooding during April. All floods reported were light or minor. New low monthly mean stages were established on the Arkansas and Cimarron Rivers.

The highest stage ever recorded was reached on the Kootenai River at Bonners Ferry, Idaho, during the last decade of May. Although an unusually heavy snow cover existed over most of the Columbia River Basin, the over-all weather pattern was favorable for the depletion of the snow with a minimum of disastrous flooding. In the upper Mississippi Basin the flooding was severe on the Chippewa River at Durand, Wis.

The most damaging flooding during July was the flash flood in the Gauley River Basin at Richwood, W. Va., with damages estimated at approximately 2 million dollars. In Ohio, residents compared the rainfall and stream flow of tributaries in the upper Miami Basin to that of the great flood of 1937. Flooding elsewhere was comparatively minor. Record to near-record low stages were reached at several points throughout the Country.

Drought conditions continued over extensive areas with record to near-record low river stages at several points in the Atlantic slope drainage and in the southern States east of the Rocky Mountains during August. It was the first time since 1900 that the North Canadian River stopped flowing at Wetumka, Okla. The Lake Fork River at Quitman, Tex., also dried up during the month. The most significant flooding occurred in the upper Big Blue River in Nebraska and Kansas. Flash floods were reported in West Virginia, Colorado, Utah, and Arizona.

There was very little flooding during September. The flooding that did occur resulted from heavy rains that accompanied Hurricane Edna in the New England States. Record to near-record low stages were reached at several points in the South Atlantic Slope drainage and in the East Gulf of Mexico drainage.

The most significant flooding during October occurred as a result of the heavy rain accompanying Hurricane Hazel as it moved in a northerly direction from Beaufort, S. C., through central North Carolina, eastern Virginia, central Maryland, central Pennsylvania, and western New York. Several million dollars' worth of damage resulted from this flooding. Two other disastrous floods with damages amounting to several millions of dollars occurred in the Chicago, Ill., and Roswell, N. Mex., areas.

There was no significant flooding during November and December. Several record low stages were reached at scattered points throughout the eastern half of the Country during November.

Table 20

RADIOSONDE DATA

Average annual values

YEAR 1954

	ALBUQUERQUE N. MEX. (838 MB.)				ANCHORAGE, ALASKA (1004 MB.)				ANNETTE, ALASKA (1009 MB.)				ATLANTA, GA. (983 MB.)				BARROW, ALASKA (1015 MB.)				8ETHEL, ALASKA (1009 MB.)				B1SMARCK, N. DAK. (955 MB.)			
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	365	1,619	15.7	35	365	42	4.2	60	363	37	7.4	75	363	309	16.0	68	360	8	-10.8	76	365	4	0.3	73	364	505	6.1	71
1000---	365	85			365	64	3.9		363	109	7.1		363	161			360	119	-10.1	78	365	79	1.0		364	124		
950----	365	538			365	483	2.1	58	363	533	4.6	70	363	602	16.7	56	360	521	- 9.2	75	365	493	- 1.1	67	364	554	6.0	65
900----	365	1,010			365	915	.2	59	363	968	1.7	71	363	1,060	14.2	56	360	934	- 9.1	71	365	919	- 2.7	66	364	995	6.5	57
850----	365	1,498			365	1,371	- 2.4	61	363	1,426	- 1.1	73	363	1,541	11.5	56	360	1,375	-10.0	66	365	1,371	- 4.4	63	364	1,462	4.7	55
800----	365	2,014	14.7		365	1,849	- 5.2	61	362	1,907	- 3.8	71	363	2,045	8.9	51	360	1,841	-11.7	62	365	1,847	- 6.4	59	364	1,955	2.6	53
750----	365	2,561	10.8		365	2,357	- 8.1	59	362	2,420	- 6.7	67	363	2,583	6.3	47	360	2,340	-13.7	59	365	2,354	- 8.8		364	2,481	.0	52
700----	365	3,127	6.4		365	2,887	-11.1		362	2,950	- 9.6	62	363	3,141	3.3	43	360	2,856	-16.1	56	365	2,880	-11.6		364	3,024	- 3.0	50
650----	365	3,731	1.7	41	365	3,457	-14.4		360	3,526	-12.9	58	361	3,744	.0		360	3,419	-19.0	53	365	3,451	-14.9	51	364	3,615	- 6.5	48
600----	365	4,370	- 3.0		364	4,054	-18.0		358	4,125	-16.5	55	355	4,375	- 3.7		360	4,003	-22.4	51	363	4,046	-18.3		364	4,228	-10.3	46
550----	365	5,052	- 7.9		363	4,701	-22.0		357	4,778	-20.5	52	353	5,060	- 7.9		359	4,643	-26.3	48	362	4,693	-22.2		364	4,897	-14.5	43
500----	363	5,787	-12.8		361	5,394	-26.6		355	5,473	-25.0	50	351	5,792	-12.7		359	5,321	-30.6		362	5,384	-26.7		361	5,609	-19.3	40
450----	363	6,591	-18.3		360	6,154	-31.6		354	6,238	-30.1		345	6,597	-18.3		359	6,071	-35.5		362	6,144	-31.7		360	6,394	-24.7	
400----	360	7,452	-24.4		358	6,970	-37.2		353	7,060	-35.9		342	7,456	-24.5		359	6,872	-41.0		361	6,961	-37.3		358	7,230	-30.8	
350----	360	8,411	-31.5		355	7,880	-43.4		350	7,975	-42.3		339	8,413	-31.7		358	7,768	-46.8		360	7,869	-43.8		353	8,164	-37.7	
300----	359	9,483	-39.6		350	8,902	-49 6		348	9,001	-48.5		333	9,484	-39 8		357	8,776	-52.1		358	8,889	-49.8		350	9,211	-45.1	
250----	356	10,705	-48.4		344	10,083	-53.2		345	10,186	-52.7		329	10,705	-48.4		356	9,950	-53.7		357	10,070	-53.1		347	10,409	-51.8	
200----	356	12,145	-56.5		333	11,523	-52.0		339	11,620	-52.2		325	12,145	-56.4		349	11,392	-50.9		355	11,508	-51.9		346	11,840	-55.2	
175----	352	12,986	-59.6		330	12,391	-50.8		336	12,486	-51.2		319	12,985	-59.4		347	12,261	-49.8		350	12,375	-50.6		345	12,691	-55.5	
150----	348	13,943	-62.1		323	13,395	-50.2		331	13,489	-51.0		307	13,941	-61.9		342	13,270	-49.5		337	13,378	-49.9		340	13,673	-55.9	
125----	341	15,062	-64.9		318	14,585	-50.2		322	14,672	-51.4		285	15,062	-64.6		334	14,464	-49.3		321	14,571	-49.9		334	14,830	-57.0	
100----	320	16,411	-66.8		304	16,044	-50.1		308	16,118	-51.7		259	16,417	-65.7		324	15,927	-49.0		302	16,033	-49.8		323	16,237	-57.7	
80-----	288	17,763	-65.0		288	17,505	-50.1		282	17,569	-51.9		222	17,773	-64.0		316	17,389	-49.0		283	17,495	-49.7		302	17,645	-57.3	
60-----	246	19,531	-61.3		251	19,380	-50.0		247	19,428	-52.3		192	19,545	-61.1		272	19,279	-49.0		263	19,377	-49.7		271	19,463	-56.5	
50-----	215	20,667	-59.4		241	20,563	-50.0		225	20,605	-52.4		170	20,681	-59.4		227	20,478	-49.1						239	20,619	-56.1	

	801SE, 1DAHO (916 MB.)				8ROWNSV1LLE, TEX. (1015 MB.)				BUFFALO, N. Y. (992 M8.)				BURRWOOD, LA. (1017 MB.)				CAR18OU, ME. (990 MB.)				CHARLESTON, S. C. (1016 MB.)				COLUMB1A, MO. (988 MB.)			
SURFACE	364	868	11.8	53	364	7	22.3	81	355	182	7.9	80	363	3	20.9	82	364	191	3.1	80	365	13	16.4	83	365	238	13.6	63
1000---	364	119			364	134	22.5	76	355	126			363	149	20.8	75	364	111			365	151	18.5	71	365	130		
950----	364	558			364	584	20.3	70	355	554	7.9	66	363	596	18.3	67	364	531	3.1	69	365	597	16.9	61	365	568	14.1	55
900----	364	1,011	13.5		364	1,046	18.6		355	995	5.4	68	363	1,054	15.9		364	965	1.3	67	365	1,051	14.4	59	365	1,020	11.9	56
850----	364	1,490	11.0	38	364	1,535	16.5	50	355	1,460	2.9	66	363	1,538	13.7	52	364	1,423	-.8	67	365	1,531	11.6	57	365	1,497	9.7	55
800----	364	1,993	7.6	39	364	2,049	14.3	44	355	1,950	.6	63	363	2,047	11.4	46	364	1,905	- 2.8	66	365	2,036	9.2	50	365	1,998	7.3	53
750----	364	2,526	3.9	43	364	2,598	11.7	40	355	2,470	- 1.8	59	363	2,589	8.8	41	364	2,422	- 5.0	62	365	2,578	6.6	45	365	2,533	4.4	50
700----	364	3,078	- .1	46	363	3,165	8.4		355	3,012	- 4.6	54	363	3,152	5.7		364	2,955	- 7.4	57	365	3,133	3.7	41	365	3,086	1.3	46
650----	364	3,673	- 4.1	46	360	3,777	4.5		353	3,598	- 7.6	50	360	3,757	2.4		363	3,535	-10.3	52	365	3,738	.3		362	3,684	- 2.2	43
600----	364	4,294	- 8.2	46	359	4,421	.4		353	4,212	-11.0	47	358	4,397	- 1.4		362	4,142	-13.5	48	364	4,368	- 3.4		360	4,311	- 6.0	41
550----	362	4,967	-12.6	44	358	5,114	- 4.0		352	4,878	-14.9		358	5,085	- 5.6		359	4,804	-17.3	45	364	5,056	- 7.5		360	4,990	-10.3	
500----	361	5,684	-17.3		358	5,859	- 8.9		352	5,590	-19.4		357	5,826	-10.4		357	5,507	-21.9		364	5,786	-12.2		358	5,714	-15.1	
450----	360	6,473	-22.9		358	6,676	-14.4		349	6,371	-24.7		357	6,641	-15.9		356	6,283	-27.1		363	6,595	-17.7		357	6,510	-20.7	
400----	358	7,319	-29.0		356	7,550	-20.7		348	7,211	-30.7		357	7,507	-22.2		354	7,114	-32.8		363	7,455	-23.9		357	7,363	-27.0	
350----	358	8,259	-36.2		352	8,522	-27.9		343	8,143	-37.4		357	8,473	-29.5		350	8,040	-39.3		363	8,415	-31.0		356	8,310	-34.2	
300----	354	9,311	-44.0		350	9,610	-36.3		342	9,191	-44.4		352	9,555	-37.7		348	9,079	-45.8		363	9,489	-39.2		356	9,371	-42.0	
250----	351	10,515	-51.4		346	10,848	-45 9		339	10,395	-50.6		349	10,786	-47.0		346	10,277	-51.3		360	10,712	-48.0		356	10,581	-50.2	
200----	347	11,946	-56.0		339	12,298	-56.4		325	11,833	-54.8		348	12,232	-56.2		345	11,716	-53.7		358	12,154	-56.2		352	12,014	-56.8	
175----	344	12,795	-56.4		336	13,135	-61.2		305	12,686	-56.1		345	13,072	-60.3		343	12,572	-53.9		357	12,995	-59.7		346	12,855	-58.9	
150----	337	13,773	-56.9		327	14,080	-65.7		283	13,662	-57 1		342	14,024	-64.1		334	13,555	-54.4		355	13,950	-62.7		339	13,817	-60.8	
125----	325	14,922	-58.2		306	15,175	-69.8		225	14,805	-57.8		331	15,129	-67.7		325	14,719	-55.0		343	15,066	-65.4		334	14,945	-62.7	
100----	307	16,321	-59.1		269	16,493	-72.1		156	16,205	-58.2		300	16,461	-69.7		314	16,135	-55.9		330	16,420	-66.7		317	16,314	-63.4	
80-----	270	17,722	-58.5		225	17,809	-70.6						266	17,794	-68.3		294	17,552	-56.3		304	17,772	-65.2		296	17,688	-62.4	
60-----	236	19,535	-57.1		184	19,538	-64.4						214	19,537	-63.9		258	19,380	-56.1		277	19,539	-61.4		258	19,470	-60.1	
50-----	209	20,692	-56.4										182	20,663	-61.4		220	20,543	-56.0		255	20,673	-59.5		235	20,611	-58.7	
40-----	166	22,110	-55.4														167	21,976	-55.5		222	22,078	-57.1		201	22,014	-57.0	
30-----																									132	23,861	-55.1	

	DODGE C1TY, KANS. (924 MB.)				EL PASO, TEX. (882 MB.)				ELY, NEV. (809 MB.)				FA1R8ANKS, ALASKA (995 MB.)				GLASGOW, MONT. (939 M8.)				GRAND JUNCTION, COLO. (852 MB.)				GREAT FALLS, MONT. (887 M8.)			
SURFACE	364	792	13.8	52	365	1,195	19.9	32	365	1,908	8.8	46	364	135	0.4	56	365	648	6.9	61	363	1,474	12.8	44	365	1,123	7.4	55
1000---	364	112			365	86			365	105			364	90			365	121			363	101			365	115		
950----	364	553			365	544			365	553			364	502	- .9	52	365	552			363	550			365	553		
900----	364	1,012	15.3		365	1,017			365	1,012			364	931	- 2.4	55	365	995	7.5		363	1,013			365	1,002		
850----	364	1,495	13.4	43	365	1,507	19.4	28	365	1,492			364	1,383	- 4.3	58	365	1,464	5.2	50	363	1,495	13.5		365	1,470	7.0	47
800----	364	2,003	10.9	42	365	2,025	15.7	30	365	2,000	11.2		364	1,859	- 6.7	58	365	1,957	2.5	51	363	2,006	12.5		365	1,966	4.3	51
750----	364	2,543	7.9	40	365	2,575	11.6		365	2,540	8.3	35	364	2,365	- 9.6	58	365	2,482	- .4	52	363	2,548	8.6	36	365	2,494	.9	54
700----	364	3,105	4.4	40	365	3,140	7.2		365	3,102	4.0	37	364	2,890	-12.6	57	364	3,025	- 3.6	50	363	3,109	4.3	39	365	3,040	- 2.8	58
650----	364	3,708	.4	39	365	3,749	2.6		365	3,703	- .5	40	364	3,459	-15.9	55	364	3,612	- 7.2	48	363	3,712	- .2	43	365	3,627	- 6.7	55
600----	363	4,341	- 3.9		365	4,387	- 2.0		365	4,334	- 5.2	42	364	4,051	-19.5	50	362	4,226	-11 1	46	363	4,342	- 4.9	46	365	4,244	-10.7	52
550----	363	5,024	- 8.6		365	5,075	- 6.7		365	5,013	- 9.9		364	4,696	-23.4		361	4,892	-15.4	45	363	5,023	- 9.6	47	364	4,909	-15.1	50
500----	362	5,754	-13.6		365	5,811	-11.6		363	5,741	-15.0		363	5,383	-27 9		359	5,601	-20.3	44	361	5,749	-14.6	43	362	5,622	-20.1	48
450----	361	6,554	-19.2		364	6,619	-17 2		363	6,537	-20.5		363	6,139	-33.0		358	6,381	-25.7	41	361	6,547	-20.1		361	6,400	-25.8	
400----	360	7,413	-25.5		361	7,483	-23.4		362	7,391	-26.6		361	6,951	-38.5		357	7,217	-31.6		360	7,401	-26.4		359	7,239	-31.8	
350----	360	8,367	-32.5		360	8,445	-30.7		358	8,341	-33.9		358	7,856	-44.8		352	8,149	-38.4		357	8,351	-33.6		357	8,167	-38.8	
300----	356	9,437	-40.3		358	9,520	-39.0		350	9,403	-42 0		357	8,872	-50.8		350	9,191	-45.7		356	9,414	-41.7		356	9,208	-46.1	
250----	351	10,656	-48.8		352	10,745	-48.1		346	10,614	-50.4		354	10,048	-54.1		344	10,382	-52.2		354	10,625	-50.0		353	10,400	-52.8	
200----	346	12,095	-56.5		331	12,186	-57.2		341	12,046	-56.9		346	11,481	-52.1		336	11,814	-54.9		353	12,058	-56.8		350	11,827	-55.9	
175----	338	12,935	-58.9		320	13,019	-60.6		336	12,888	-58.5		345	12,347	-50.7		330	12,667	-54.7		347	12,899	-58.5		347	12,677	-55.7	
150----	332	13,894	-60.9		308	13,970	-63.8		330	13,854	-59.9		340	13,350	-50.1		322	13,652	-54.8		342	13,863	-60.1		344	13,657	-58.0	
125----	325	15,021	-63.1		287	15,076	-67.2		321	14,987	-61.7		336	14,539	-49 8		321	14,814	-55.7		334	14,993	-62.2		334	14,813	-56.8	
100----	295	16,387	-64.1		249	16,415	-68.9		305	16,364	-62 6		327	15,996	-49.7		308	18,230	-56.4		312	16,365	-63.6		318	16,225	-57.5	
80-----	265	17,751	-62.8		222	17,750	-66.9		286	17,739	-61.8		313	17,456	-49.5		289	17,645	-55.9		294	17,736	-62.6		300	17,633	-57.2	
60-----	218	19,535	-60.1						242	19,528	-59 2		284	19,350	-49.6		257	19,477	-55.1		260	19,522	-59.8		270	19,454	-56.3	
50-----	192	20,674	-58.5						216	20,675	-58.1		260	20,549	-49 8		223	20,647	-54.7		225	20,666	-58.5		247	20,616	-55.8	
40-----	139	22,085	-56.7						164	22,089	-56 3		200	22,014	-49.9		173	22,086	-54.5						207	22,042	-55.0	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average annual values

Table 20—Continued

YEAR 1954

Standard pressure surface (mb.)	GREEN BAY, WIS. (990 MB.)				GREENSBORO, N. C. (986 MB.)				HATTERAS, N. C. (1017 MB.)				HAVANA, CUBA (1011 MB.)				HILO, T. H. (1014 MB.)				INTERNAT. FALLS, MINN. (972 MB.)				KOTZEBUE, ALASKA (1012 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	365	210	6.4	76	363	273	12.9	75	364	3	17.0	80	315	49	26.1		364	9	24.7	74	361	360	2.7	74	365	5	- 5.1	77
1000---	365	126			363	154			364	148	17.1	73	315	147	25.2		364	128	22.8	74	361	125			365	97	- 4.5	
950----	365	554	7.0	65	363	591	14.9	57	364	587	14.8	66	315	599	21.6		364	577	19.2	79	361	544	3.5	68	365	507	- 4.0	63
900----	365	993	4.9	63	363	1,045	12.4	57	364	1,040	12.1	62	315	1,064	18.4		364	1,037	16.0	82	361	981	1.9	67	365	928	- 5.3	61
850----	365	1,457	2.8	60	363	1,522	9.5	57	364	1,517	9.6	56	315	1,553	15.7		364	1,521	13.1	82	361	1,440	.1	65	365	1,375	- 6.8	59
800----	365	1,946	1.0	56	363	2,023	6.8	56	364	2,018	7.2	50	315	2,065	13.2		364	2,030	11.2	70	361	1,925	- 1.6	61	365	1,847	- 8.6	57
750----	365	2,469	- 1.3	52	363	2,557	4.3	51	364	2,554	4.7	44	315	2,610	10.6		364	2,577	9.4		361	2,442	- 3.7	55	365	2,352	-10.8	54
700----	365	3,011	- 3.9	49	363	3,111	1.5		363	3,106	1.9		315	3,178	7.7		364	3,138	7.1		360	2,979	- 6.3	51	365	2,873	-13.5	51
650----	365	3,597	- 6.9	47	363	3,711	- 1.7		362	3,707	- 1.3		314	3,790	4.3		363	3,749	4.1		358	3,561	- 9.2	47	365	3,439	-16.6	49
600----	365	4,213	-10.3	45	361	4,337	- 5.4		361	4,334	- 5.0		314	4,433	.7		362	4,391	.6		356	4,171	-12.7	45	365	4,030	-20.0	46
550----	365	4,879	-14.5		358	5,020	- 9.4		361	5,017	- 9.1		314	5,129	- 3.3		357	5,085	- 3.5		353	4,831	-16.8	43	364	4,673	-23.9	44
500----	364	5,594	-19.0		357	5,746	-14.0		360	5,744	-13.7		313	5,875	- 8.0		355	5,832	- 8.2		352	5,538	-21.4		364	5,360	-28.4	
450----	364	6,376	-24.3		357	6,547	-19.4		359	6,546	-19.0		312	6,698	-13.1		355	6,652	-13.7		351	6,312	-26.7		363	6,113	-33.4	
400----	364	7,219	-30.3		357	7,403	-25.5		358	7,403	-25.1		311	7,574	-19.2		354	7,527	-20.1		349	7,146	-32.6		361	6,924	-38.9	
350----	362	8,155	-37.0		353	8,358	-32.3		358	8,359	-32.2		310	8,554	-26.4		350	8,501	-27.6		346	8,073	-39.3		358	7,826	-45.2	
300----	360	9,203	-44.1		350	9,427	-40.2		358	9,428	-40.0		308	9,648	-35.0		350	9,590	-36.0		342	9,111	-46.2		354	8,841	-51.1	
250----	360	10,406	-50.6		346	10,647	-48.3		352	10,649	-48.4		304	10,894	-44.7		348	10,830	-45.4		340	10,307	-51.8		350	10,017	-53.9	
200----	359	11,845	-54.6		340	12,090	-55.6		350	12,090	-56.0		299	12,352	-55.2		346	12,281	-56.1		337	11,745	-53.9		345	11,455	-51.5	
175----	356	12,697	-55.4		332	12,934	-58.2		348	12,933	-58.8		295	13,194	-60.5		337	13,120	-61.5		332	12,599	-54.1		331	12,327	-50.2	
150----	352	13,677	-56.4		328	13,898	-60.2		343	13,894	-61.4		291	14,142	-65.8		322	14,065	-66.8		325	13,586	-54.6		324	13,338	-49.6	
125----	339	14,830	-57.7		315	15,027	-62.4		333	15,016	-63.7		284	15,237	-70.2		300	15,153	-71.4		316	14,749	-55.5		310	14,535	-49.2	
100----	325	16,235	-58.4		301	16,398	-63.4		310	16,378	-64.7		277	16,553	-72.7		242	16,463	-74.0		307	16,169	-56.1		295	16,002	-49.0	
80-----	304	17,640	-58.0		278	17,767	-62.1		286	17,743	-63.4		263	17,865	-71.2						284	17,585	-56.3		284	17,463	-48.9	
60-----	270	19,454	-57.0		246	19,557	-59.3		252	19,521	-60.4		247	19,590	-64.8						240	19,417	-56.0					
50-----	237	20,612	-56.5		227	20,703	-57.7		232	20,661	-58.8		229	20,712	-61.0						214	20,589	-55.3					
40-----	190	22,034	-55.8		190	22,119	-56.1		199	22,068	-57.0		193	22,110	-57.4													

Standard pressure surface (mb.)	LAKE CHARLES, LA. (1017 MB.)				LANDER, WYO. (828 MB.)				LAS VEGAS, NEV. (936 MB.)				LITTLE ROCK, ARK. (1007 MB.)				MCGRATH, ALASKA (998 MB.)				MAZATLAN, MEXICO (1009 MB.)				MEDFORD, ORE. (969 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	363	5	19.3	78	363	1,696	8.8	48	365	660	21.2	25	363	79	17.3	64	365	103	- 0.3	66	318	14	25.3		365	401	13.5	62
1000---	363	146	20.0	70	363	99			365	78			363	137	18.0	58	365	87	.1		318	97	24.7		365	134		
950----	363	590	18.2	64	363	540			365	531			363	583	17.4	53	365	499	- 1.6	59	318	558	24.1		365	572	14.4	52
900----	361	1,050	15.9	59	363	1,000			365	998	21.9		363	1,037	14.8	55	365	926	- 3.1	61	318	1,020	22.4		365	1,023	11.8	51
850----	361	1,534	13.9	54	363	1,478			365	1,490	18.1	25	363	1,519	12.2	55	365	1,377	- 4.5	61	318	1,515	19.5		365	1,499	8.6	54
800----	361	2,044	11.6	48	363	1,983	9.8		365	2,005	13.9	27	363	2,026	9.7	51	365	1,853	- 6.7	60	318	2,034	16.4		365	1,997	5.2	56
750----	361	2,586	8.9	44	363	2,520	6.3	36	365	2,550	9.8	29	362	2,565	6.9	48	365	2,359	- 9.3	58	318	2,589	13.0		365	2,527	2.2	54
700----	360	3,149	5.9		363	3,077	2.1	39	365	3,113	5.6		362	3,123	3.9	45	365	2,885	-12.1	55	309	3,157	9.2		365	3,076	- .7	48
650----	359	3,755	2.3		363	3,674	- 2.3	42	365	3,718	1.3		361	3,728	.5	41	365	3,454	-15.2		292	3,774	5.1		364	3,669	- 4.0	
600----	356	4,394	- 1.6		362	4,301	- 6.7	42	365	4,354	- 3.1		361	4,360	- 3.3		365	4,049	-18.7		281	4,416	.8		364	4,292	- 7.7	
550----	353	5,083	- 5.9		362	4,975	-11.4	42	363	5,039	- 7.8		358	5,047	- 7.4		365	4,696	-22.7		267	5,114	- 3.7		363	4,965	-11.9	
500----	351	5,821	-10.8		360	5,698	-16.6	40	362	5,771	-12.9		354	5,778	-12.2		364	5,386	-27.2		260	5,858	- 8.5		360	5,687	-16.6	
450----	348	6,632	-16.2		359	6,487	-22.4		360	6,574	-18.8		353	6,585	-17.7		363	6,146	-32.2		241	6,675	-13.7		359	6,478	-22.1	
400----	344	7,500	-22.4		358	7,334	-28.7		359	7,433	-25.4		349	7,447	-23.8		363	6,959	-37.7		222	7,553	-19.6		358	7,325	-28.2	
350----	337	8,465	-29.6		357	8,275	-35.9		358	8,387	-33.0		348	8,408	-31.0		362	7,866	-44.0		208	8,531	-26.9		354	8,269	-35.4	
300----	331	9,545	-37.9		351	9,329	-43.9		356	9,451	-41.1		345	9,482	-39.1		362	8,886	-50.0						351	9,325	-43.3	
250----	324	10,773	-47.1		344	10,529	-51.8		352	10,666	-49.7		339	10,707	-47.9		362	10,064	-53.5						347	10,530	-51.1	
200----	311	12,220	-56.1		333	11,953	-57.2		348	12,096	-57.5		333	12,151	-55.8		361	11,504	-51.8						340	11,960	-56.6	
175----	301	13,060	-60.1		327	12,794	-58.1		343	12,934	-59.8		332	12,994	-58.9		358	12,370	-50.4						337	12,806	-57.1	
150----	293	14,012	-63.7		319	13,762	-58.8		329	13,892	-61.9		326	13,954	-61.6		352	13,376	-49.9						333	13,780	-57.5	
125----	279	15,120	-67.1		308	14,903	-60.0		306	15,010	-64.3		315	15,075	-64.3		343	14,569	-49.7						316	14,929	-58.8	
100----	253	16,457	-69.2		296	16,291	-60.9		265	16,366	-65.8		296	16,433	-65.8		331	16,036	-49.7						279	16,325	-59.5	
80-----	225	17,790	-68.1		274	17,679	-60.0						262	17,792	-64.4		321	17,500	-49.6						246	17,721	-59.4	
60-----	190	19,533	-63.7		244	19,482	-58.2						227	19,562	-60.9										207	19,521	-57.7	
50-----	175	20,657	-61.0		221	20,635	-57.2						198	20,702	-58.9										193	20,674	-57.0	
40-----					176	22,046	-56.1						161	22,106	-56.9													
30-----					100	23,876	-54.7																					

Standard pressure surface (mb.)	MERIDA, MEXICO (1013 MB.)				MIAMI, FLA. (1017 MB.)				MIDLAND, TEX. (916 MB.)				NANTUCKET, MASS. (1014 MB.)				NASHVILLE, TENN. (997 MB.)				NOME, ALASKA (1011 MB.)				NORTH PLATTE, NEBR. (916 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	343	27	25.1		365	4	23.0	78	365	871	18.7	44	365	14	9.1	85	363	177	15.4	71	365	7	- 2.4	74	365	848	9.8	66
1000----	343	137	24.5		365	150	22.8	74	365	106			365	127	10.1	77	363	147			365	90	- 1.9		365	108		
950-----	343	589	22.2		365	598	19.9	73	365	556			365	554	9.2	69	363	585	15.3	55	365	500	- 2.9	63	365	547		
900-----	343	1,055	19.5		365	1,061	17.0		365	1,022	19.6		365	1,001	7.1	65	363	1,041	12.6	55	365	924	- 4.3	62	365	997	12.0	
850-----	343	1,546	16.6		365	1,546	14.4	64	365	1,512	17.2	39	365	1,469	5.0	61	363	1,518	10.0	55	365	1,373	- 5.7	60	365	1,476	10.7	49
800-----	343	2,060	13.8		365	2,057	12.1	54	365	2,027	14.1	39	365	1,962	2.7	56	363	2,020	7.5	51	365	1,847	- 7.5	57	365	1,979	8.6	47
750-----	343	2,606	11.3		365	2,599	9.5		365	2,574	10.8	38	365	2,487	.4	51	363	2,555	4.9	47	365	2,351	- 9.8	54	365	2,514	5.6	45
700-----	341	3,176	8.4		364	3,165	6.5		365	3,140	7.2		365	3,033	- 2.2	48	363	3,109	1.8	45	365	2,877	-12.4		365	3,071	2.1	44
650-----	334	3,790	5.1		363	3,773	3.1		364	3,749	3.0		365	3,623	- 5.2	47	361	3,708	- 1.6	43	365	3,445	-15.5		364	3,669	- 1.8	44
600-----	330	4,434	1.6		360	4,413	- .6		361	4,389	- 1.3		364	4,243	- 8.8	43	359	4,335	- 5.2		364	4,039	-18.9		364	4,297	- 6.0	44
550-----	326	5,131	- 2.5		359	5,104	- 4.8		358	5,079	- 5.9		364	4,915	-12.8		359	5,018	- 9.2		364	4,685	-22.9		361	4,975	-10.6	43
500-----	323	5,880	- 7.1		357	5,847	- 9.4		358	5,816	-10.9		364	5,633	-17.4		358	5,744	-13.8		364	5,375	-27.3		361	5,699	-15.7	40
450-----	318	6,701	-12.5		352	6,663	-14.7		355	6,628	-16.5		364	6,420	-22.7		358	6,546	-19.2		364	6,131	-32.4		359	6,493	-21.3	
400-----	313	7,584	-18.6		351	7,535	-20.9		353	7,493	-22.8		364	7,269	-28.6		357	7,403	-25.2		363	6,946	-38.0		358	7,344	-27.5	
350-----	306	8,564	-25.9		349	8,507	-28.0		350	8,458	-29.9		363	8,211	-35.3		357	8,358	-32.2		363	7,852	-44.2		356	8,290	-34.6	
300-----	296	9,660	-34.4		346	9,595	-36.3		346	9,537	-38.1		363	9,267	-42.5		356	9,428	-39.8		363	8,871	-50.2		350	9,349	-42.5	
250-----	286	10,907	-44.2		344	10,833	-45.8		339	10,766	-46.9		360	10,477	-49.6		352	10,650	-48.1		362	10,048	-53.6		345	10,557	-50.5	
200-----	267	12,364	-55.6		342	12,283	-56.1		327	12,214	-55.6		355	11,920	-54.9		349	12,095	-55.4		360	11,487	-51.4		339	11,989	-56.6	
175-----	250	13,202	-61.5		340	13,121	-61.1		323	13,056	-59.3		353	12,770	-56.2		345	12,940	-58.2		360	12,356	-49.9		337	12,832	-58.3	
150-----	231	14,144	-67.4		333	14,068	-65.7		313	14,013	-62.5		350	13,745	-57.4		342	13,904	-60.5		359	13,365	-49.2		332	13,797	-59.9	
125-----	184	15,225	-72.3		318	15,164	-69.5		288	15,126	-65.8		341	14,891	-58.5		335	15,032	-62.9		357	14,560	-49.1		325	14,931	-61.4	
100-----					282	16,483	-71.8		265	16,471	-67.9		324	16,289	-59.3		314	16,398	-63.9		353	16,023	-48.9		296	16,313	-62.3	
80------					247	17,801	-70.0		239	17,816	-66.3		297	17,686	-58.9		280	17,767	-62.7		343	17,492	-48.6		271	17,691	-61.3	
60------					218	19,531	-64.7		200	19,576	-62.1		267	19,496	-57.5		240	19,550	-59.9		325	19,384	-48.5		239	19,485	-59.3	
50------					206	20,651	-61.3		177	20,711	-59.5		246	20,649	-56.7		221	20,691	-58.4		307	20,587	-48.7		211	20,631	-58.0	
40------					172	22,043	-58.0						210	22,071	-55.5		175	22,100	-56.3		273	22,056	-48.8					
30------																					192	23,964	-48.7					

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average annual values

Table 20—Continued

YEAR 1954

Standard pressure surface (mb.)	NORTHWAY, ALASKA (947 MB.)				OAKLAND, CALIF. (1016 MB.)				OKLAHOMA CITY, OKLA. (970 MB.)				OMAHA, NEBR. (977 MB.)				PHOENIX, ARIZ. (973 MB.)				PITTSBURGH, PA. (974 MB.)				PORTLAND, ME. (1012 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	364	524	- 2.0	61	365	6	13.9	73	361	391	16.3	60	364	403	11.6	66	364	341	24.2	36	363	353	10.3	71	365	20	5.9	82
1000---	364	93			365	139	13.6	70	361	127			364	128			364	94			363	141			365	120	7.2	72
950----	364	503	- 1.1		365	577	13.7	57	361	571	17.7	50	364	562	11.9	58	364	549	25.6		363	573	10.3	66	365	544	6.4	66
900----	364	933	- 2.1		365	1,027	13.5	42	361	1,029	16.0	48	364	1,012	10.5	56	364	1,019	22.3		363	1,019	7.9	66	365	984	4.4	67
850----	364	1,386	- 3.4	58	365	1,506	11.5		361	1,512	13.7	47	364	1,486	8.8	52	364	1,511	18.4		363	1,488	5.3	65	365	1,448	2.3	66
800----	364	1,864	- 5.6	59	365	2,010	9.1		361	2,021	11.0	44	364	1,987	6.7	49	364	2,027	14.4		363	1,981	3.0	59	365	1,936	.1	61
750----	364	2,373	- 8.5	60	365	2,549	6.3		361	2,562	8.0	41	364	2,520	4.0	47	364	2,573	10.3		363	2,508	.6	55	365	2,456	- 2.1	56
700----	364	2,899	-11.7	59	364	3,104	3.1		361	3,122	4.6	38	364	3,072	.8	46	364	3,137	6.2		363	3,053	- 2.3	52	365	2,997	- 4.7	51
650----	363	3,470	-15.2	57	363	3,705	- .5		360	3,726	.9		364	3,669	- 2.9	44	363	3,746	2.1		363	3,644	- 5.4	48	365	3,582	- 7.6	47
600----	363	4,063	-18.9	55	360	4,336	- 4.5		359	4,360	- 3.2		361	4,294	- 6.8	45	363	4,381	- 2.2		362	4,263	- 8.9		364	4,196	-11.1	
550----	361	4,711	-22.9	52	360	5,017	- 9.0		359	5,047	- 7.6		361	4,970	-11.1	43	362	5,069	- 6.8		362	4,935	-12.9		362	4,861	-15.2	44
500----	361	5,398	-27.3		360	5,746	-14.1		359	5,778	-12.4		361	5,694	-15.9		360	5,804	-11.8		360	5,652	-17.4		361	5,573	-19.7	
450----	360	6,157	-32.4		360	6,545	-19.9		357	6,584	-18.0		359	6,489	-21.4		357	6,613	-17.4		359	6,440	-22.7		359	6,352	-25.0	
400----	360	6,970	-38.0		360	7,400	-26.3		357	7,443	-24.4		357	7,338	-27.5		357	7,474	-23.7		357	7,288	-28.7		357	7,193	-30.8	
350----	360	7,877	-44.3		358	8,350	-33.7		357	8,401	-31.4		356	8,284	-34.6		355	8,434	-31.1		356	8,230	-35.3		352	8,126	-37.4	
300----	360	8,895	-50.2		354	9,412	-41.8		355	9,473	-39.3		353	9,344	-42.3		352	9,509	-39.2		354	9,286	-42.6		349	9,175	-44.1	
250----	359	10,074	-53.8		351	10,624	-50.3		351	10,696	-48.0		348	10,554	-50.1		348	10,732	-48.0		347	10,495	-49.6		343	10,377	-50.2	
200----	355	11,511	-52.0		346	12,055	-57.2		347	12,138	-56.1		338	11,992	-56.2		339	12,175	-56.3		343	11,934	-55.4		332	11,817	-54.1	
175----	350	12,379	-50.7		333	12,894	-59.0		345	12,980	-59.0		327	12,836	-57.9		335	13,016	-59.4		337	12,779	-57.1		321	12,670	-54.8	
150----	347	13,384	-50.2		321	13,860	-60.2		342	13,940	-61.5		318	13,804	-58.8		333	13,973	-62.3		324	13,751	-58.7		317	13,653	-55.6	
125----	340	14,576	-50.1						331	15,062	-64.4		305	14,940	-60.9		318	15,090	-65.3		296	14,889	-59.9		304	14,810	-56.6	
100----	332	16,038	-50.0						307	16,421	-65.8		292	16,321	-61.7		298	16,441	-66.9		243	16,274	-60.4		291	16,222	-57.5	
80-----	321	17,498	-50.1						261	17,778	-64.3		268	17,706	-60.9		277	17,793	-65.4		169	17,661	-59.8		271	17,629	-57.1	
60-----	292	19,386	-50.1						211	19,551	-60.9		236	19,505	-58.8		253	19,557	-61.7						239	19,452	-56.4	
50-----	272	20,576	-50.3						172	20,691	-58.9		218	20,652	-57.9		231	20,692	-59.4						219	20,612	-55.9	
40-----	228	22,044	-50.4										182	22,068	-56.3		204	22,094	-57.2						180	22,035	-54.9	

	RAPID CITY, S. DAK. (904 MB.)				ST. CLOUD, MINN. (977 MB.)				ST. PAUL, ALASKA (1009 MB.)				SAN ANTONIO, TEX. (988 MB.)				SAN JUAN, P. R. (1014 MB.)				SANTA MARIA, CALIF. (1008 MB.)				S. STE. MARIE, MICH. (989 MB.)			
SURFACE	364	966	8.6	59	365	316	5.5	75	358	10	1.4	83	365	243	21.5	55	364	19	24.8	82	364	74	12.8	79	365	221	3.8	84
1000---	364	113			365	126			358	78	1.1		365	133			364	144	24.4	79	364	134	13.2	75	365	128		
950----	364	548			365	552	6.4	66	358	494	- .6	79	365	581	20.7	55	364	597	21.4	79	364	573	14.9	58	365	550	4.2	68
900----	364	1,000	9.1		365	991	4.9	63	358	920	- 1.8	72	365	1,045	17.8	58	364	1,061	18.4	79	364	1,025	15.5	40	365	985	2.2	67
850----	364	1,475	9.2	49	365	1,457	3.5	58	358	1,374	- 3.3		365	1,532	15.2	56	364	1,550	15.5	75	364	1,508	13.4		365	1,445	.2	66
800----	364	1,975	6.5	50	365	1,947	1.7	53	358	1,852	- 5.3		365	2,044	12.9	50	364	2,062	13.1	66	364	2,016	10.7		365	1,930	- 1.8	62
750----	364	2,505	3.5	50	365	2,471	- .6	49	358	2,363	- 7.7		365	2,589	10.3	42	364	2,608	10.7	55	364	2,556	8.0		365	2,447	- 3.8	57
700----	364	3,058	.2	48	365	3,014	- 3.4	47	358	2,890	-10.4		365	3,155	7.3		364	3,176	8.0	46	364	3,116	4.7		365	2,984	- 6.3	53
650----	364	3,652	- 3.6	47	364	3,602	- 6.7	44	358	3,465	-13.5		362	3,764	3.6		364	3,790	4.5		364	3,721	1.2		365	3,565	- 9.1	49
600----	364	4,276	- 7.8	47	363	4,217	-10.4	43	358	4,062	-17.1		359	4,406	- .4		364	4,432	.8		363	4,355	- 2.9		364	4,175	-12.6	48
550----	364	4,949	-12.4		362	4,884	-14.6		356	4,714	-21.0		358	5,098	- 4.9		364	5,129	- 3.0		362	5,040	- 7.5		363	4,836	-16.5	
500----	364	5,669	-17.2		362	5,598	-19.2		356	5,407	-25.5		358	5,839	- 9.8		364	5,875	- 7.5		362	5,774	-12.6		361	5,544	-21.1	
450----	364	6,457	-22.8		361	6,380	-24.6		355	6,174	-30.5		354	6,654	-15.5		362	6,700	-12.8		362	6,578	-18.4		355	6,321	-26.3	
400----	362	7,303	-29.0		361	7,221	-30.5		354	6,991	-36.2		353	7,523	-21.8		362	7,576	-18.9		362	7,437	-24.9		350	7,159	-31.9	
350----	361	8,242	-36.1		359	8,155	-37.6		353	7,904	-42.7		350	8,492	-29.0		361	8,556	-26.0		360	8,393	-32.4		343	8,090	-38.5	
300----	360	9,295	-43.6		359	9,201	-44.9		349	8,931	-48.7		350	9,576	-37.3		360	9,652	-34.3		360	9,461	-40.6		324	9,135	-45.3	
250----	359	10,498	-51.1		358	10,401	-51.4		346	10,116	-52.1		345	10,809	-46.5		359	10,900	-44.0		359	10,677	-49.3		285	10,335	-50.6	
200----	355	11,929	-56.1		358	11,836	-54.9		340	11,558	-51.5		335	12,260	-55.8		358	12,360	-55.2		359	12,113	-56.9					
175----	351	12,775	-57.0		355	12,688	-55.5		337	12,428	-50.2		332	13,101	-60.0		357	13,200	-61.3		356	12,953	-59.3					
150----	345	13,747	-57.7		355	13,667	-56.3		328	13,435	-49.5		320	14,054	-63.7		356	14,142	-67.2		355	13,912	-61.5					
125----	340	14,893	-59.1		352	14,822	-57.4		325	14,628	-49.6		303	15,160	-67.2		347	15,226	-72.2		352	15,035	-64.0					
100----	327	16,288	-59.8		338	16,226	-58.1		320	16,088	-49.4		267	16,495	-69.7		323	16,526	-75.1		341	16,394	-65.3					
80-----	312	17,683	-59.3		323	17,629	-57.7		306	17,552	-49.1		217	17,824	-68.1		287	17,820	-74.4		333	17,755	-64.0					
60-----	281	19,490	-57.6		284	19,448	-56.8		286	19,436	-49.0		188	19,569	-63.6		246	19,521	-66.9		312	19,527	-61.2					
50-----	244	20,644	-56.9		256	20,607	-56.2		262	20,630	-49.1		171	20,697	-60.8		240	20,631	-63.0		291	20,666	-59.3					
40-----	193	22,064	-56.0						208	22,104	-49.2		143	22,090	-57.6		215	22,016	-59.4		252	22,072	-57.1					
30-----																	165	23,830	-56.4		154	23,903	-55.0					

	SPOKANE, WASH. (931 MB.)				SWAN ISLAND, W. I. (1013 MB.)				TACUBAYA, MEXICO (774 MB.)				TAMPA, FLA. (1017 MB.)				TATOOSH ISLAND, WASH. (1012 MB.)				VERACRUZ, MEXICO (1012 MB.)				WASHINGTON, D. C. (1007 MB.)			
SURFACE	365	722	9.4	59	348	10	26.0	81	273	2,306	16.5		363	7	20.1	83	363	31	9.4	84	275	13	25.6		365	88	12.3	68
1000---	365	125			348	124	25.6	79	273	58			363	156	20.9	76	363	132	9.1	80	275	118	24.8		365	145	12.8	63
950----	365	557			348	577	22.3	81	273	522			363	603	18.8	70	363	561	7.3	74	275	565	22.0		365	581	11.9	61
900----	365	1,005	9.0		348	1,043	19.3		273	1,001			363	1,063	16.3		363	1,000	5.0	72	275	1,035	19.5		365	1,027	9.4	62
850----	365	1,476	6.1	53	348	1,533	16.6	71	273	1,493			363	1,547	13.9	61	363	1,464	2.4	70	275	1,525	16.8		365	1,499	6.9	62
800----	365	1,970	2.8	54	348	2,048	13.9	64	273	2,025			363	2,057	11.5		363	1,952	.0	64	274	2,040	14.0		365	1,996	4.4	60
750----	365	2,493	- .7	55	348	2,597	11.3	55	273	2,577	14.7		363	2,601	9.0		363	2,473	- 2.5	57	274	2,588	11.2		365	2,527	1.8	56
700----	365	3,037	- 4.2	55	345	3,163	8.5		273	3,151	10.2		363	3,162	6.0		363	3,011	- 5.3	53	271	3,156	8.3		365	3,073	- 1.0	51
650----	365	3,621	- 7.7	52	345	3,779	5.2		273	3,769	5.4		363	3,773	2.7		363	3,595	- 8.6	51	270	3,771	5.1		364	3,667	- 4.1	47
600----	365	4,236	-11.5	49	345	4,422	1.6		273	4,413	.8		362	4,409	- 1.0		361	4,206	-12.2	50	263	4,415	1.4		360	4,288	- 7.6	
550----	364	4,899	-15.7	47	340	5,119	- 2.2		269	5,110	- 3.3		360	5,102	- 5.2		361	4,868	-16.5	48	258	5,109	- 2.6		359	4,964	-11.5	
500----	364	5,610	-20.3	45	337	5,870	- 6.7		259	5,856	- 7.7		356	5,840	- 9.8		358	5,577	-21.1		249	5,860	- 7.1		359	5,684	-16.1	
450----	364	6,387	-25.7		335	6,695	-11.8		251	6,677	-12.8		354	6,656	-15.2		357	6,353	-26.4		243	6,685	-12.3		357	6,480	-21.4	
400----	364	7,225	-31.6		332	7,578	-17.8		241	7,558	-18.7		352	7,525	-21.4		355	7,187	-32.1		236	7,566	-18.3		357	7,328	-27.5	
350----	364	8,156	-38.4		328	8,562	-25.0		209	8,539	-26.0		351	8,495	-28.5		355	8,116	-38.8		225	8,548	-25.4		356	8,275	-34.4	
300----	362	9,199	-45.7		320	9,663	-33.2						347	9,580	-36.8		354	9,157	-45.9		212	9,647	-33.9		355	9,335	-41.8	
250----	360	10,393	-52.3		314	10,917	-42.9						343	10,816	-46.0		351	10,352	-52.1		195	10,899	-43.6		354	10,549	-49.2	
200----	355	11,825	-54.5		306	12,384	-54.4						336	12,266	-55.6		347	11,785	-54.1		184	12,363	-55.1		351	11,989	-55.5	
175----	346	12,679	-54.1		302	13,226	-60.5						335	13,108	-60.0		343	12,642	-53.6		173	13,203	-61.1		346	12,836	-57.7	
150----	337	13,671	-54.4		280	14,169	-66.8						325	14,059	-64.0		336	13,632	-53.4						341	13,802	-59.5	
125----	299	14,841	-55.5		239	15,254	-72.2						319	15,166	-67.8		331	14,801	-54.2						334	14,935	-61.0	
100----					191	16,554	-75.3						304	16,498	-69.9		322	16,226	-55.1						313	18,314	-61.6	
80-----													273	17,826	-68.5		304	17,648	-55.0						283	17,694	-60.9	
60-----													245	19,568	-64.1		277	19,489	-54.4						257	19,488	-58.8	
50-----													224	20,689	-61.4		252	20,658	-54.3						243	20,633	-57.7	
40-----													205	22,081	-58.1		207	22,089	-53.9						219	22,045	-56.4	
30-----													158	23,906	-54.8										169	23,879	-54.5	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average annual values

Table 20—Continued

YEAR 1954

Standard pressure surface (mb.)	YAKUTAT, ALASKA (1009 MB.) Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	365	12	5.4	78
1000--	365	86	5.1	
950---	365	506	3.4	70
900---	365	940	.8	69
850---	365	1,397	- 1.9	68
800---	365	1,877	- 4.5	66
750---	365	2,388	- 7.2	62
700---	365	2,917	-10.3	60
650---	365	3,491	-13.7	57
600---	364	4,088	-17.3	53
550---	362	4,738	-21.5	51
500---	362	5,431	-26.0	48
450---	361	6,192	-31.2	
400---	361	7,010	-36.9	
350---	360	7,921	-43.2	
300---	360	8,944	-49.1	
250---	356	10,128	-52.5	
200---	350	11,570	-51.4	
175---	347	12,437	-50.4	
150---	338	13,439	-50.0	
125---	327	14,628	-50.2	
100---	315	16,084	-50.0	
80----	302	17,539	-50.0	
60----	275	19,424	-50.2	
50----	244	20,619	-50.2	

* Observations scheduled at 1500 G.C.T.

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T., "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average annual resultant winds

Table 21

YEAR 1954

Altitude (meters) m. s. l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)			* Buffalo, N.Y. (182 m.)			Burlington, Vt. (100 m.)			Charleston, S. C. (16 m.)			Cincinnati, Ohio, (273 m.)			El Paso, Tex. (1,198 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface----------	356	186	0.0	363	239	1.8	346	290	1.6	347	297	1.4	359	323	0.4	362	125	4.7	347	249	2.4	341	269	1.0	356	192	0.0	350	247	2.0	360	225	0.4
500--------------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	356	136	1.4	346	260	4.5	340	246	2.6	352	205	.2	350	251	2.9	---	---	---
1,000------------	351	190	.0	---	---	---	---	---	---	339	290	2.6	359	317	.4	302	152	.5	330	263	6.5	306	263	4.2	338	256	2.4	325	256	4.2	---	---	---
1,500------------	341	207	.3	---	---	---	346	271	3.4	315	286	4.1	358	275	1.6	263	172	.0	307	267	7.6	247	269	6.1	312	281	4.1	288	265	5.5	360	229	1.8
2,000------------	313	230	3.8	363	241	2.5	335	275	4.9	292	283	6.1	349	259	2.8	220	215	.3	290	273	8.5	193	278	7.6	287	287	5.9	257	275	6.7	360	236	2.2
2,500------------	296	248	4.4	360	259	3.1	315	276	6.6	270	287	8.2	327	260	4.4	204	239	1.8				172	283	9.1	266	289	6.7	230	284	8.0	353	249	2.8
3,000------------	281	259	5.2	353	268	4.3	292	274	8.4	246	288	10.2	308	258	6.0	187	261	2.5				149	289	10.3	248	287	7.8	204	292	9.0	350	259	3.8
4,000------------	262	273	6.9	337	275	6.5	241	274	10.7	215	291	12.9	279	257	8.0	159	274	3.6							208	282	8.7				324	264	5.7
5,000------------	229	280	8.3	320	276	8.6	203	279	12.9	182	290	15.7	259	260	10.3										166	280	9.5				303	267	7.0
6,000------------	216	284	9.1	296	276	9.6							233	262	11.6										152	281	10.0				277	272	8.0
8,000------------				241	278	10.5																									232	271	8.5
10,000-----------				174	282	11.7																									192	275	11.0
12,000-----------																															170	275	13.3

	Ely, Nev. (1,910 m.)			Grand Junction, Colo. (1,475 m.)			Green Bay, Wis. (210 m.)			Greensboro, N.C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Little Rock, Ark. (88 m.)			Medford, Ore. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)		
Surface----------	358	205	0.2	364	271	1.9	344	265	1.5	343	263	1.7	349	274	2.1	355	87	1.5	347	199	0.1	351	301	0.8	361	109	2.2	341	198	0.0	345	259	1.5
500--------------	---	---	---	---	---	---	344	270	2.5	343	257	2.4	---	---	---	350	136	.3	347	220	.4	351	302	.9	360	109	2.3	333	212	.2	345	251	2.4
1,000------------	---	---	---	---	---	---	316	270	4.5	337	260	3.5	349	269	3.6	333	233	1.7	327	239	2.3	348	246	.8	352	110	.9	311	278	1.0	319	255	3.2
1,500------------	---	---	---	364	270	1.9	267	276	6.2	323	272	4.7	333	267	5.8	313	266	3.1	303	259	3.4	334	220	.5	340	266	.7	254	323	.5	301	262	4.2
2,000------------	358	214	.4	364	265	2.2	233	283	7.7	300	283	6.3	299	268	7.3	286	277	4.4	275	275	4.7	313	220	.8	323	264	1.8	222	314	3.4	276	275	5.2
2,500------------	356	228	2.8	361	246	2.8	204	287	9.3	280	286	8.0	274	270	8.7	256	283	5.4	254	279	5.6	278	231	4.0	300	264	2.6	189	312	4.3	259	279	6.5
3,000------------	344	233	3.6	350	246	4.1	185	290	10.6	264	289	9.5	242	275	9.8	241	281	6.1	232	286	6.6	266	245	4.7	293	268	3.3	160	303	5.6	245	288	7.5
4,000------------	302	249	5.1	321	262	6.3	149	293	12.9	234	288	11.3	169	277	11.7	208	281	8.1	194	291	8.5	222	259	6.7	239	264	4.8				221	289	9.3
5,000------------	271	259	7.5	291	269	8.7				200	290	12.6				181	283	9.9	139	300	10.1	206	261	8.6	205	271	7.1				191	292	10.9
6,000------------	240	262	9.9	255	275	10.1				157	290	12.7				148	281	11.2				195	264	9.8	183	273	8.5				163	293	11.2
8,000------------	143	266	11.0	209	281	12.7																163	263	12.2									

	* Oakland, Calif. (8 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (345 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			* Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (725 m.)			** Washington, D. C. (88 m.)		
Surface----------	359	265	3.2	351	261	0.5	365	243	0.7	357	354	0.0	339	290	1.1	357	152	0.2	356	269	2.9	361	289	1.9	346	217	0.4	364	257	1.5
500--------------	355	277	2.4	351	244	.8	365	232	.9	---	---	---	339	282	1.3	357	144	.4	338	288	2.2	360	292	2.8	---	---	---	363	266	3.1
1,000------------	334	283	1.9	324	241	2.0	364	215	.2	357	352	.0	299	266	2.5	350	154	.3	304	306	.5	360	283	4.3	346	216	.7	363	268	4.9
1,500------------	327	274	2.3	293	262	4.1	363	207	.1	355	316	.7	263	277	4.8	329	177	.0	294	312	.4	360	285	5.8	323	227	5.0	363	272	6.9
2,000------------	319	270	2.5	272	272	6.1	357	219	.4	328	287	3.8	246	283	6.9	298	220	.5	289	271	.8	360	287	7.3	283	235	5.3	364	277	8.8
2,500------------	311	271	2.9	252	280	7.8	352	234	2.3	297	283	6.2	224	288	9.1	270	247	3.1	283	272	1.8	360	286	8.9	254	244	5.8	363	279	10.3
3,000------------	309	265	3.7	239	282	9.2	344	242	3.0	287	285	8.5	200	286	10.7	264	261	4.0	279	266	2.7	360	285	10.4	223	248	6.4	362	280	11.7
4,000------------	302	288	5.6	213	290	11.4	325	252	4.2	229	288	11.1	162	288	13.9	228	272	5.9	268	261	4.2	357	287	13.1				359	278	13.9
5,000------------	289	265	7.8	188	293	12.8	309	261	5.6	203	289	13.2	126	291	15.9	194	274	7.7	248	264	5.7	356	287	15.4				358	276	16.5
8,000------------	278	263	9.0	157	298	14.9	281	265	6.9	166	288	14.8				165	279	8.4	237	260	6.4	353	286	18.1				355	275	18.7
8,000------------	211	262	11.5				192	266	7.1										183	262	7.2	343	286	22.9				353	271	23.0
10,000-----------																						309	285	27.7				352	272	26.9
12,000-----------																						258	285	27.6				343	273	28.0
14,000-----------																						219	287	21.5				332	274	24.2
18,000-----------																												315	273	17.5

** Rawin Data (Cont'd.)
18,000 m., 280 obs., 278 dir., 8.7 speed
20,000 m., 229 obs., 268 dir., 3.4 speed

* Rawin Data

These free-air resultant winds are based on pilot balloon observations made near 2100 G. C. T.; directions in degrees from North (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

RAWIN DATA

Table 22

Average annual resultant winds

YEAR 1954

Altitude (meters) m. s. l.	Albuquerque, N. Mex. (1,636 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Buffalo N.Y. (182 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S. C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N. C. (275 m.)			Hatteras, N. C. (3 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	365	110	0.9	361	45	0.3	365	116	3.6	352	232	1.3	363	96	1.0	363	272	1.7	365	200	0.0	364	129	0.7	364	52	0.6	361	270	0.4	358	232	1.4
500	---	---	---	---	---	---	365	136	1.8	321	260	4.0	357	118	1.1	361	277	2.9	356	215	.5	364	190	.0	---	---	---	361	252	2.1	339	250	3.5
1,000	---	---	---	356	311	2.3	361	141	1.1	333	271	6.6	348	112	.8	358	280	4.1	350	244	2.8	364	240	3.9	---	---	---	360	260	3.9	336	261	4.4
1,500	---	---	---	356	300	4.3	360	151	.4	320	272	7.7	342	59	.4	353	280	5.2	351	270	3.4	364	260	5.5	361	51	.6	359	269	5.0	335	269	5.2
2,000	365	260	2.3	355	294	6.5	358	168	.0	311	278	8.5	335	289	.6	351	277	6.3	351	279	4.7	362	270	6.9	361	241	1.5	357	273	6.0	333	274	6.2
2,500	365	265	3.9	350	290	8.1	355	210	.1	297	281	9.4	335	279	1.9	348	274	7.5	348	282	5.3	360	276	8.1	360	242	2.8	354	277	7.0	331	274	7.1
3,000	364	270	4.9	346	294	10.0	353	255	1.5				332	273	2.9	339	273	8.5	344	282	6.2	360	283	9.3	361	246	4.3	351	279	8.1	325	275	8.0
4,000	359	273	6.2	328	289	12.5	342	277	3.1				330	275	4.9	322	270	10.4	332	281	8.0	356	286	11.1	363	262	6.4	339	279	9.3	315	273	10.1
5,000	354	278	7.6	302	285	14.5	330	279	4.6				323	275	6.5	299	270	11.5	309	283	8.3	354	287	13.1	358	269	8.6	320	279	10.9	293	271	11.1
6,000	338	278	8.7	278	283	16.0	313	282	5.7				316	277	8.0	277	267	12.8	293	283	9.1	352	287	15.2	342	273	10.9	295	279	11.4	266	275	10.9
8,000	293	280	8.8				272	273	8.3				299	275	10.3	211	263	13.6	226	279	8.8	350	282	19.7	279	273	12.5	238	281	12.5			
10,000	242	280	8.5				240	275	10.8				264	277	11.0	154	267	13.7				342	280	23.3	209	273	12.0	197	278	13.5			
12,000	196	279	9.1																			332	280	24.8									
14,000																						314	278	21.8									
16,000																						293	280	14.8									
18,000																						244	286	7.2									
20,000																						183	301	2.6									

Altitude (meters) m. s. l.	Int. Falls, Minn. (358 m.)			Little Rock, Ark. (80 m.)			Medford, Ore. (401 m.)			Miami, Fla. (4 m.)			Midland, Tex. (871 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma, City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			St. Cloud, Minn. (318 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	360	278	0.6	365	173	0.0	365	316	0.3	365	89	1.2	364	143	0.3	349	259	1.8	364	226	0.7	365	267	2.2	361	146	0.3	364	1	0.0	364	336	0.0
500	356	270	1.1	364	198	.1	361	317	.4	365	111	2.7	---	---	---	342	268	5.7	351	233	2.2	363	285	2.9	350	153	.3	---	---	---	363	312	.5
1,000	354	283	3.1	362	225	3.9	360	302	1.8	365	120	2.4	364	156	.3	338	271	6.7	345	243	3.8	362	278	3.0	343	191	.1	360	3	.0	362	278	2.2
1,500	349	293	4.5	355	246	4.3	356	244	2.3	365	151	.2	364	179	.0	332	269	7.8	343	259	4.6	362	266	2.6	339	222	1.2	359	303	2.1	358	285	4.1
2,000	345	296	5.8	347	262	4.9	359	230	4.0	365	195	.0	363	208	.5	330	268	8.9	345	270	5.7	364	268	2.9	341	250	5.1	359	288	4.0	357	288	5.8
2,500	342	294	7.2	333	274	5.4	358	236	5.4	365	237	1.4	363	242	3.9	325	267	10.2	341	278	6.7	363	270	3.5	342	264	5.8	360	286	5.6	353	288	7.2
3,000	341	295	8.6	323	284	6.0	356	245	6.6	363	249	2.1	361	257	4.2	322	264	11.8	343	281	7.9	363	268	4.3	342	272	6.3	358	285	7.9	352	290	9.0
4,000	329	292	11.5	293	291	7.3	351	254	8.6	361	267	3.9	357	275	5.7	287	267	13.2	334	284	9.4	358	268	6.0	343	286	7.3	348	284	11.4	340	289	11.3
5,000	315	292	13.9	262	294	7.5	335	260	10.5	358	268	5.3	347	277	7.2	252	269	14.4	312	288	10.5	356	270	8.2	331	284	8.4	328	281	14.0	329	288	13.1
6,000	298	290	15.8	225	293	7.0	308	259	12.2	348	272	6.7	343	277	8.1	225	270	15.3	286	287	10.5	345	267	9.6	319	280	9.1	306	277	15.6	321	287	15.3
8,000	246	291	19.2				261	259	14.4	335	274	10.6	312	276	9.5							318	265	12.0	293	275	10.8	231	270	16.9	274	284	17.2
10,000	172	292	22.2				197	264	14.8	317	274	14.0	258	278	10.1							278	267	14.1	245	273	10.4				225	275	20.5
12,000										278	275	14.8	207	274	11.5							206	263	15.7	216	275	11.9				154	278	20.3
14,000										238	281	11.9	175	279	9.9																		

Altitude (meters) m. s. l.	San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)			Santa Maria, Calif. (72 m.)			Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is. Wash. (33 m.)			Washington, D. C. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	363	137	0.7	365	109	3.0	364	265	1.8	360	321	0.1	363	204	0.1	358	178	0.0	365	242	0.8
500	363	133	5.2	365	96	7.2	357	340	.1	359	305	1.5	---	---	---	350	208	.4	362	265	4.3
1,000	361	152	.5	365	96	7.4	357	352	.0	359	294	3.5	360	222	.8	346	217	.8	362	275	6.3
1,500	361	180	.0	364	93	6.8	358	13	.0	359	289	5.2	357	233	5.1	343	219	1.0	362	279	7.1
2,000	361	221	.6	363	91	6.4	356	356	.0	358	291	6.6	354	240	5.9	342	231	5.3	362	281	8.0
2,500	360	245	2.6	363	92	5.9	356	304	2.0	358	289	7.5	350	250	6.6	341	242	6.4	364	282	9.1
3,000	360	260	3.5	363	89	5.1	354	286	3.4	358	288	9.2	345	254	7.6	338	249	7.2	365	279	9.9
4,000	357	271	5.2	361	91	3.3	354	274	5.6	358	289	11.7	335	257	9.7	324	254	8.8	360	276	12.3
5,000	350	273	6.8	359	74	2.0	346	270	7.0	356	288	14.4	318	261	11.6	305	255	10.7	358	276	14.7
6,000	345	273	8.2	356	22	.1	334	269	7.9	350	287	16.8	300	260	12.7	282	255	12.4	355	275	17.6
8,000	310	275	10.1	354	295	4.0	311	268	8.9	334	284	22.1				226	256	15.7	353	272	22.6
10,000	271	274	12.3	353	284	9.8	288	266	11.4	275	284	27.3							345	273	27.1
12,000	224	274	13.2	352	277	14.2	256	262	13.7	205	285	29.3							339	273	28.0
14,000				339	282	13.4	228	261	12.0										326	276	25.1
16,000				313	291	5.8	207	263	7.6										306	277	16.7
18,000				251	66	2.6	198	300	2.0										266	273	9.1
20,000				220	85	8.0	187	54	3.7										241	270	4.1
22,000				181	89	10.3	153	81	6.5										210	290	.9

These free-air resultant winds are based on rawin observations made near 0300 G. C. T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second. Annual values are not computed for any level having less than 10 monthly values or having more than 1 monthly value missing in a single season.

SOLAR RADIATION DATA

Table 30

Average daily values (direct and diffuse) received
on a horizontal surface, tabulated in langleys.

YEAR 1954

Station	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Aklavik, MacKenzie	59	48	186	411	595	575	509	338	176	55	11	---	---
Albrook Air Base, Panama, C.Z.	---	---	522	495	407	379	365	362	424	395	379	429	---
Albuquerque, N. Mex.	312	456	502	668	708	777	724	645	568	471	374	295	542
Annette, Alaska	---	---	320	397	405	386	390	425	269	125	40	33	---
Apalachicola, Fla.	266	---	---	654	642	677	---	---	---	---	---	---	---
Astoria, Ore.	90	158	289	362	585	405	488	360	312	229	93	79	288
Atlanta, Ga.	241	328	457	514	593	677	584	541	471	387	257	211	438
Barrow, Alaska	3	35	165	349	497	539	409	249	121	34	8	---	---
Bethel, Alaska	51	141	262	477	534	536	363	216	172	104	39	22	243
Bismarck, N. Dak.	158	221	363	425	580	537	592	508	363	254	176	131	359
Blue Hill, Mass.	121	192	323	394	390	479	504	389	258	225	148	110	294
Boise, Idaho	112	223	327	518	630	566	651	563	469	343	193	142	395
Boston, Mass.	118	181	315	386	388	448	483	383	279	196	130	---	---
Brownsville, Tex.	294	398	414	495	565	592	603	585	471	390	337	301	454
Canton Island, Pacific Area	620	635	678	671	640	627	552	580	663	672	633	632	634
Carihou, Me.	131	215	338	455	391	448	434	435	303	186	96	99	294
Charleston, S. C.	257	351	418	503	520	628	583	578	468	406	298	268	440
Columbia, Mo.	206	314	390	487	583	619	652	504	473	289	237	153	409
Columbus, Ohio	146	240	353	479	---	---	---	---	---	---	44	---	---
Davis, Calif.	168	224	361	537	673	695	710	606	520	366	161	104	427
Dodge City, Kans.	247	392	438	525	497	706	641	579	430	375	307	249	449
East Lansing, Mich.	96	165	285	396	445	438	455	384	293	183	139	101	282
East Wareham, Mass.	144	214	347	416	419	523	498	397	297	261	173	141	319
Edmonton, Alberta	94	151	281	392	413	441	534	327	301	218	189	73	285
El Paso, Tex.	349	448	494	625	719	741	682	621	570	483	401	335	539
Ely, Nevada	235	381	464	606	659	685	668	656	536	407	286	233	485
Fairhanks, Alaska	18	90	234	432	582	529	452	361	219	96	25	5	254
Fort Worth, Tex.	228	466	466	555	610	752	696	677	610	441	381	---	---
Fresno, Calif.	253	293	428	590	707	739	711	660	547	417	225	134	475
Grand Junction, Colo.	230	358	429	604	706	707	682	620	487	394	271	225	476
Great Falls, Mont.	---	220	370	447	541	560	664	527	421	287	169	135	---
Greenshoro, N. C.	215	318	397	509	572	679	622	547	494	378	217	181	427
Griffin, Ga.	230	365	450	504	572	692	625	483	451	390	266	233	438
Hatteras, N. C.	246	363	418	553	613	703	628	631	491	421	276	237	465
Indianapolis, Ind.	136	222	332	445	507	577	603	472	422	240	173	113	354
Inyokern, Calif.	319	465	572	727	801	842	790	766	---	471	354	295	---
Ithaca, N. Y.	111	164	276	362	480	519	574	409	299	215	138	96	304
Lake Charles, La.	209	399	381	498	591	613	560	524	501	389	322	269	438
Lander, Wyo.	---	320	437	559	632	679	702	610	---	---	239	195	---
Las Vegas, Nevada	283	439	525	670	709	721	662	646	580	446	326	268	523
Lexington, Ky.	---	---	---	563	597	701	721	534	535	354	226	158	---
Lincoln, Nebr.	185	274	338	434	485	594	580	449	437	237	229	160	367
Little Rock, Ark.	184	346	374	486	545	650	625	566	482	310	258	175	417
Los Angeles, Calif. (WBAS)	267	407	461	472	504	578	618	523	500	369	280	247	436
Los Angeles, Calif. (WBCO)	235	385	382	435	524	577	632	539	502	368	273	235	424
Madison, Wis.	152	204	323	380	468	548	514	473	331	211	127	207	328
Matanuska, Alaska	---	---	---	284	480	487	349	297	206	87	28	15	---
Medford, Ore.	116	260	388	538	671	599	767	608	496	333	166	125	422
Miami, Fla.	339	410	487	483	504	463	483	534	454	404	376	359	441
Midland, Tex.	314	438	486	581	664	691	733	650	587	420	347	278	516
Nashville, Tenn.	177	308	365	508	566	689	630	501	474	329	235	147	411
Newport, R. I.	151	232	372	456	429	568	550	470	319	282	194	142	347
New York, N. Y.	141	230	353	437	438	586	585	436	344	277	169	135	344
Oak Ridge, Tenn.	167	250	343	468	499	580	555	455	432	328	217	161	371
Oklahoma City, Okla.	254	369	384	469	483	709	696	653	560	392	344	279	466
Ottawa, Ontario	174	221	198	432	437	723	566	467	333	217	90	115	331
Phoenix, Ariz.	305	462	501	690	755	768	654	643	586	479	380	277	542
Portland, Me.	---	---	---	---	521	550	---	---	---	---	---	118	---
Proeeer 4 NE, Wash.	145	186	391	523	643	654	717	586	470	299	145	110	406
Rapid City, S. Dak.	175	275	359	427	527	530	559	535	451	308	220	168	378
Resolute, NWT, Canada	---	164	141	408	556	739	---	---	---	---	---	---	---
Richland, Wash.	---	---	---	---	---	---	---	---	---	---	120	102	---
Riverside, Calif.	269	428	412	550	616	671	668	616	560	422	326	264	484
St. Cloud, Minn.	---	---	---	---	---	---	532	506	295	197	157	128	---
San Antonio, Tex.	319	468	473	498	625	683	692	654	560	440	366	---	---
Santa Maria, Calif.	258	401	446	542	631	721	711	602	542	435	302	263	488
Sault Ste. Marie, Mich.	136	198	346	415	544	492	598	476	269	196	109	98	323
Sayville, N. Y.	143	279	385	479	443	601	594	474	353	299	191	156	366
Schenectady, N. Y.	121	182	288	347	396	454	473	377	290	208	126	104	281
Seabrook, N. J.	166	263	354	477	477	606	508	463	411	279	181	135	360
Seattle, Wash. (WBAS)	77	130	343	421	541	516	542	374	319	203	91	61	302
Seattle, Wash. (U. of W.)	76	122	287	307	366	329	375	---	---	---	---	---	---
Spokane, Wash.	---	---	---	---	---	---	---	---	444	327	176	---	---
State College, Pa.	132	180	306	420	502	578	554	378	312	199	130	94	315
Stillwater, Okla.	---	394	416	502	520	648	634	547	459	303	274	225	---
Swan Island, W. I.	445	519	581	594	577	449	614	595	491	434	379	406	507
Tallahassee, Fla.	---	---	414	---	---	---	---	---	---	---	---	---	---
Tampa, Fla.	343	414	519	557	602	571	499	515	451	433	364	323	466
Toronto, Ontario	---	---	---	343	494	501	550	413	332	224	114	99	---
Upton, N. Y.	145	258	384	469	445	578	621	544	338	304	187	152	369
Wake Island, Pacific Area	432	475	578	615	628	659	572	580	506	472	456	385	530
Washington, D. C., (Silver Bill)	186	---	370	462	563	585	577	450	415	307	195	---	---
Winnipeg, Manitoba	124	226	385	421	526	525	575	481	332	224	140	89	337

Note: Langley is the unit used to denote one gram calorie per square centimeter.

SOLAR RADIATION DATA

Table 33.*-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.

	Resolute Bay, N.W.T.			Resolute Bay, N.W.T.			Resolute Bay, N.W.T.			Resolute Bay, N.W.T.			Resolute Bay, N.W.T.			Resolute Bay, N.W.T.			Resolute Bay, N.W.T.			Resolute Bay, N.W.T.			Resolute Bay, N.W.T.			Resolute Bay, N.W.T.			Resolute Bay, N.W.T.			Resolute Bay, N.W.T.
1952		1952			1952			1952			1953			1953			1953			1953			1953			1953			1953			1954		
Jan. 29----	---	Mar.	4	58	Apr.	1	272	May	6	453	Apr.	2	---	May	7	582	June	4	469	July	2	148	Aug.	6	286	Sept.	3	90	Oct.	1	---	Feb.	5	1
30----	---		5	(41)		2	299		7	509		3	---		8	668		5	579		3	507		7	209		4	87		2	68		6	2
31----	---		6	66		3	(302)		8	450		4	---		9	764		6	622		4	798		8	104		5	(124)		3	72		7	2
Feb. 1----	---		7	---		4	331		9	387		5	---		10	697		7	587		5	792		9	456		6	(139)		4	---		8	3
2----	---		8	58		5	346		10	536		6	---		11	654		8	607		6	669		10	301		7	(58)		5	42		9	---
3----	---		9	(97)		6	337		11	---		7	---		12	450		9	644		7	609		11	288		8	(137)		6	36		10	4
4----	---		10	---		7	363		12	487		8	---		13	407		10	726		8	224		12	181		9	(173)		7	43		11	6
Averages-----	---			(64)			(321)			470			---			603			608			535			261			(116)			52			3
Departures---	---			---			---			---			---			---			---			---			---			---			---			---
Feb. 5----	1	Mar.	11	(106)	Apr.	8	323	May	13	391	Apr.	9	---	May	14	660	June	11	635	July	9	434	Aug.	13	---	Sept.	10	(190)	Oct.	8	32	Feb.	12	7
6----	---		12	114		9	352		14	321		10	---		15	751		12	725		10	307		14	163		11	---		9	52		13	10
7----	---		13	121		10	---		15	448		11	---		16	682		13	767		11	165		15	---		12	---		10	61		14	10
8----	1		14	131		11	305		16	433		12	---		17	---		14	869		12	258		16	---		13	219		11	86		15	17
9----	---		15	138		12	407		17	514		13	---		18	647		15	670		13	---		17	202		14	95		12	57		16	14
10----	3		16	145		13	422		18	562		14	---		19	530		16	448		14	---		18	261		15	---		13	19		17	14
11----	4		17	150		14	333		19	---		15	---		20	670		17	448		15	584		19	182		16	99		14	26		18	12
Averages-----	2			(129)			357			445			---			657			652			349			202			(151)			48			12
Departures---	---			---			---			---			---			---			---			---			---			---			---			---
Feb. 12----	4	Mar.	18	155	Apr.	15	374	May	20	670	Apr.	16	---	May	21	580	June	18	415	July	16	544	Aug.	20	199	Sept.	17	---	Oct.	15	42	Feb.	19	(13)
13----	(5)		19	169		16	273		21	614		17	---		22	559		19	849		17	419		21	352		18	---		16	17		20	28
14----	5		20	170		17	334		22	---		18	---		23	556		20	461		18	198		22	214		19	---		17	32		21	34
15----	---		21	(127)		18	390		23	---		19	---		24	589		21	590		19	534		23	61		20	154		18	---		22	23
16----	9		22	150		19	(460)		24	---		20	---		25	492		22	398		20	401		24	191		21	---		19	13		23	40
17----	(8)		23	(226)		20	341		25	---		21	---		26	672		23	614		21	672		25	52		22	178		20	9		24	19
18----	16		24	170		21	466		26	---		22	322		27	650		24	487		22	619		26	250		23	---		21	---		25	25
Averages-----	(8)			(167)			(377)			---			---			585			545			484			188			---			22			(26)
Departures---	---			---			---			---			---			---			---			---			---			---			---			---
Feb. 19----	14	Mar.	25	138	Apr.	22	528	May	27	---	Apr.	23	519	May	28	654	June	25	708	July	23	657	Aug.	27	292	Sept.	24	---	Oct.	22	---	Feb.	26	27
20----	19		26	229		23	552		28	---		24	428		29	584		26	541		24	549		28	336		25	---		23	---		27	(34)
21----	12		27	216		24	449		29	---		25	504		30	803		27	422		25	250		29	270		26	---		24	---		28	33
22----	13		28	243		25	366		30	---		26	---		31	512		28	654		26	345		30	252		27	77		25	---	Mar.	1	46
23----	26		29	261		26	451		31	---		27	527	June	1	693		29	693		27	511		31	202		28	---		26	5		2	78
24----	29		30	268		27	499	June	1	---		28	449		2	513		30	826		28	429	Sept.	1	157		29	58		27	3		3	103
25----	(25)		31	277		28	545		2	---		29	331		3	557	July	1	539		29	362		2	138		30	---		28	2		4	45
Averages-----	(20)			233			484			---			460			617			626			443			235			---			---			(52)
Departures---	---			---			---			---			---			---			---			---			---			---			---			---
Feb. 26----	37				Apr.	29	592				Apr.	30	---							July	30	433							Oct.	29	2			
27----	43					30	222				May	1	608								31	348								30	8			
28----	41				May	1	---					2	495							Aug.	1	346								31	1			
29----	---					2	418					3	575								2	344							Nov.	1	T			
March 1----	56					3	441					4	637								3	322								2	T			
2----	32					4	584					5	596								4	302								3	T			
3----	45					5	422					6	536								5	396								**4	---			
Averages-----	42						446						575									356									2			
Departures---	---						---						---									---									---			

Note.--Langley is tbe unit used to denote one gram calorie per square centimeter.
Values in parentbeses are interpolated.

* Data not available for publication in monthly issues.
** Sun below borizon after November 4, 1953.

SOLAR RADIATION DATA

Table 33.*-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.-Continued

	Resolute Bay, N.W.T.			Matanuska, Alaska	Resolute Bay, N.W.T.			Edmonton, Alberta	Matanuska, Alaska	Prosser 4 NE, Wash.	Resolute Bay, N.W.T.			Edmonton, Alberta	Matanuska, Alaska	Prosser 4 NE, Wash.			Edmonton, Alberta	Matanuska, Alaska			Albrook AFB, Canal Zone	Matanuska, Alaska			Albrook AFB, Canal Zone	Matanuska, Alaska			Matanuska, Alaska	Davis, Calif.
1954																																
March 5----	47	Apr.	2	---	---	May	7	449	194	677	497	June	4	106	---	817	July	2	188	---	Aug.	6	381	513	Sept.	3	377	221	Oct.	1	167	429
6----	50		3	---	307		8	178	429	475	---		5	102	393	640		3	311	---		7	301	361		4	628	127		2	242	430
7----	71		4	---	340		9	157	616	217	399		6	58	---	324		4	630	402		8	420	336		5	498	249		3	225	421
8----	98		5	---	318		10	258	615	684	357		7	155	---	751		5	604	154		9	224	346		6	433	127		4	227	419
9----	105		6	---	344		11	78	578	674	393		8	129	667	573		6	691	175		10	330	464		7	502	364		5	---	423
10----	66		7	---	320		12	112	633	768	590		9	425	---	689		7	585	659		11	406	130		8	554	252		6	---	378
11----	101		8	---	220		13	250	731	766	553		10	504	539	613		8	594	478		12	267	109		9	511	176		7	---	328
Averages-----	79			---	308			212	542	609	465			211	---	630			515	374			333	323			500	217			215	404
Departures---	---			---	---			---	---	---	---			---	---	---			---	---			---	---			---	---			---	---
March 12----	91	Apr.	9	---	267	May	14	540	248	730	477	June	11	347	259	706	July	9	316	658	Aug.	13	377	303	Sept.	10	384	129	Oct.	8	23	403
13----	---		10	---	---		15	592	570	498	488		12	708	---	293		10	468	508		14	404	191		11	367	325		9	126	404
14----	154		11	---	347		16	161	611	721	622		13	367	462	647		11	734	---		15	401	348		12	265	369		10	110	407
15----	(165)		12	---	262		17	610	608	768	584		14	754	328	600		12	501	---		16	405	270		13	472	260		11	148	395
16----	(173)		13	---	405		18	563	628	740	---		15	564	576	553		13	698	582		17	422	444		14	356	106		12	105	389
17----	146		14	---	469		19	650	644	740	654		16	137	537	772		14	634	583		18	245	153		15	370	227		13	102	388
18----	(123)		15	---	---		20	600	---	642	529		17	400	686	779		15	335	---		19	158	65		16	477	57		14	116	384
Averages-----	(142)			---	350			531	551	691	559			468	475	621			527	583			345	253			384	210			104	396
Departures---	---			---	---			---	---	---	---			---	---	---			---	---			---	---			---	---			---	---
March 19----	149	Apr.	16	---	389	May	21	104	395	730	499	June	18	250	651	784	July	16	713	197	Aug.	20	142	430	Sept.	17	182	106	Oct.	15	39	364
20----	162		17	---	417		22	191	460	796	575		19	441	---	423		17	589	260		21	618	494		18	625	301		16	44	302
21----	209		18	---	481		23	533	580	726	780		20	514	362	806		18	729	429		22	358	313		19	576	58		17	154	365
22----	202		19	---	379		24	677	---	593	---		21	717	160	835		19	565	363		23	320	220		20	299	292		18	54	357
23----	---		20	---	476		25	205	297	713	---		22	711	73	831		20	357	130		24	425	244		21	456	321		19	15	276
24----	204		21	---	(494)		26	47	497	709	---		23	601	684	567		21	282	204		25	433	352		22	523	193		20	42	369
25----	249		22	---	487		27	291	285	832	642		24	621	658	802		22	638	161		26	519	407		23	621	169		21	114	353
Averages-----	196			---	(446)			293	419	728	624			551	431	721			553	249			402	351			469	206			66	341
Departures---	---			---	---			---	---	---	---			---	---	---			---	---			---	---			---	---			---	---
March 26----	---	Apr.	23	---	426	May	28	515	---	571	(544)	June	25	638	631	702	July	23	589	224	Aug.	27	358	82	Sept.	24	375	218	Oct.	22	50	343
27----	261		24	---	(503)		29	591	408	214	686		26	362	697	464		24	635	448		28	333	300		25	134	302		23	---	358
28----	---		25	---	(424)		30	789	598	630	820		27	---	289	753		25	681	462		29	385	433		26	470	271		24	44	367
29----	---		26	---	471		31	152	674	548	576		28	---	543	823		26	459	546		30	278	349		27	456	165		25	10	353
30----	---		27	---	494	June	1	378	---	839	738		29	---	373	799		27	(447)	451		31	380	301		28	426	35		26	56	352
31----	---		28	365	530		2	442	---	752	676		30	---	658	294		28	314	329	Sept.	1	378	352		29	366	33		27	27	348
April 1----	---		29	184	563		3	596	---	388	(803)	July	1	702	150	578		29	586	388		2	---	260		30	203	124		28	9	331
Averages-----	---			---	(487)			495	---	563	(692)			---	477	630			(530)	407			352	297			347	164			33	350
Departures---	---			---	---			---	---	---	---			---	---	---			---	---			---	---			---	---			---	---
		Apr.	30	303	462												July	30	512	72									Oct.	29	37	297
		May	1	446	509													31	635	56										30	30	302
			2	258	593												Aug.	1	265	80										31	40	291
			3	418	477													2	261	110									Nov.	1	22	276
			4	223	488													3	131	413										2	26	244
			5	448	495													4	108	175										3	8	214
			6	345	618													5	265	481										4	64	259
			Avg.	349	520														311	198											32	269
			Dep.	---	---														---	---											---	---

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

* Data not available for publication in monthly issues.

SOLAR RADIATION DATA

Table 33*.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.

	Lexington, Ky.			Lexington, Ky.			Lexington, Ky.			Lexington, Ky.			Lexington, Ky.			Lexington, Ky.			Lexington, Ky.			Lexington, Ky.	Davis, Calif.	Richland, Wash.			Lexington, Ky.
1954																											
April 2------	686	May	7	322	June	4	122	July	2	665	Aug.	6	750	Sept.	3	642	Oct.	1	333	Nov.	5	101	274	94	Dec.	3	198
3 ------	663		8	599		5	767		3	525		7	655		4	641		2	266		6	308	230	77		4	306
4 ------	425		9	637		6	775		4	601		8	---		5	628		3	454		7	401	223	104		5	24
5------	386		10	616		7	796		5	794		9	278		6	596		4	503		0	(381)	10	66		6	323
6------	294		11	636		8	460		6	853		10	642		7	521		5	422		9	366	60	50		7	317
7------	676		12	739		9	613		7	552		11	583		8	553		6	76		10	374	72	208		8	100
8------	631		13	331		10	813		8	711		12	429		9	632		7	578		11	367	59	100		9	40
Averages------	537			554			621			672			556			602			376			(329)	132	101			180
Departures----	---			---			---			---			---			---			---			---	---	---			---
April 9------	752	May	14	373	June	11	601	July	9	853	Aug.	13	568	Sept.	10	585	Oct.	8	382	Nov.	12	256	240	194	Dec.	10	113
10------	505		15	519		12	771		10	830		14	358		11	330		9	480		13	346	218	71		11	207
11------	162		16	776		13	630		11	804		15	463		12	642		10	516		14	348	31	50		12	48
12------	757		17	246		14	736		12	758		16	636		13	631		11	314		15	348	79	95		13	35
13------	669		18	785		15	597		13	735		17	328		14	596		12	492		16	134	251	157		14	29
14------	515		19	220		16	573		14	780		18	580		15	576		13	164		17	256	265	83		15	45
15------	447		20	668		17	527		15	726		19	463		16	617		14	293		18	149	265	33		16	166
Averages------	544			512			634			784			485			568			377			262	193	99			92
Departures----	---			---			---			---			---			---			---			---	---	---			---
April 16------	88	May	21	840	June	18	701	July	16	854	Aug.	20	322	Sept.	17	458	Oct.	15	312	Nov.	19	131	109	179	Dec.	17	40
17------	(765)		22	850		19	833		17	830		21	494		18	460		16	190		20	31	109	104		18	73
18------	736		23	797		20	827		18	742		22	679		19	490		17	521		21	111	41	180		19	147
19------	762		24	824		21	756		19	698		23	634		20	280		18	414		22	140	57	179		20	188
20------	766		25	636		22	734		20	604		24	677		21	429		19	364		23	219	45	169		21	134
21------	754		26	---		23	870		21	202		25	652		22	611		20	474		24	170	24	29		22	297
22------	622		27	674		24	869		22	733		26	515		23	629		21	470		25	57	36	158		23	292
Averages------	(642)			770			799			666			568			480			392			123	60	143			167
Departures----	---			---			---			---			---			---			---			---	---	---			---
April 23------	489	May	28	401	June	25	838	July	23	802	Aug.	27	618	Sept.	24	599	Oct.	22	443	Nov.	26	---	230	83	Dec.	24	291
24------	655		29	566		26	748		24	814		28	533		25	478		23	434		27	---	226	157		25	310
25------	752		30	792		27	819		25	816		29	682		26	410		24	447		28	---	236	169		26	(284)
26------	682		31	734		28	879		26	790		30	594		27	548		25	408		29	(200)	249	175		27	(184)
27------	520	June	1	486		29	862		27	791		31	607		28	507		26	159		30	268	182	139		28	25
28------	276		2	776		30	675		28	601	Sept.	1	716		29	270		27	198	Dec.	1	200	20	127		29	92
29------	(489)		3	575	July	1	776		29	682		2	695		30	274		28	278		2	200	28	53		30	57
																										31	135
Averages------	(552)			619			800			757			635			441			338			(217)	167	129		Avg.	(172)
Departures----	---			---			---			---			---			---			---			---	---	---		Dep.	---
April 30------	(406)							July	30	738							Oct.	29	90								
May 1------	540								31	680								30	172								
2------	485							Aug.	1	405								31	323								
3------	162								2	295							Nov.	1	184								
4------	810								3	599								2	212								
5------	593								4	529								3	196								
6------	741								5	453								4	49								
Averages------	(534)								Avg.	528								Avg.	175								
Departures----	---								Dep.	---								Dep.	---								

Note:--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

* Data not available for publication in monthly issues.

SOLAR RADIATION DATA

Table 30 *Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun.

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
MADISON, WIS.									
	Air mass								
	5.0	4.0	3.0	2.0	#1.0	2.0	3.0	4.0	5.0
April 1954									
1-----	0.86	0.97	1.09	1.21	----	----	----	----	----
3-----	.85	.97	----	----	----	----	----	----	----
6**---	----	----	----	----	----	1.03	0.75	0.63	----
8-----	----	.96	1.07	1.25	1.50	1.27	1.08	.94	0.82
11----	.60	.70	.88	1.21	1.45	1.14	.92	.78	.65
12----	.84	.96	1.09	1.28	1.51	1.20	1.03	.86	.75
13**--	----	----	----	----	----	1.00	.78	.63	.53
16----	----	----	----	----	1.51	1.19	1.01	.84	.69
17----	----	----	----	----	----	1.18	1.00	.89	.78
22----	----	----	----	----	----	1.24	1.04	.88	.75
23----	----	----	----	----	1.47	1.09	.84	.65	.50
Averages	.79	.91	1.03	1.24	1.49	1.15	.94	.79	.68
Departures	.11	.08	.05	.08	.09	-.04	-.06	----	----
MADISON, WIS.									
	Air mass								
	5.0	4.0	3.0	2.0	#1.0	2.0	3.0	4.0	5.0
July 1954									
1-----	0.84	0.96	1.05	1.21	1.35	----	----	----	----
6-----	----	.57	.71	.91	----	----	----	----	----
8-----	----	.90	1.00	1.09	1.28	----	----	----	----
12----	----	----	----	.94	1.31	----	1.15	0.93	0.81
15----	.78	.87	.99	1.15	1.33	----	----	----	----
18----	----	----	----	----	----	1.14	.98	.83	.74
19----	----	----	.91	1.05	----	.98	.77	.61	.51
22----	.58	.66	.77	.96	----	----	----	----	----
24----	----	----	----	----	1.27	.98	.75	.62	.54
25----	----	----	----	----	----	----	----	.72	.61
26----	.46	.54	.68	.88	1.19	.84	.63	.49	.42
27----	.55	.67	.79	.98	1.27	1.04	.82	.67	----
Averages	.64	.74	.86	1.02	1.29	1.00	.85	.70	.61
Departures	.00	.00	.00	-.02	.01	.02	-.01	----	----

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
MADISON, WIS.									
	Air mass								
	5.0	4.0	3.0	2.0	#1.0	2.0	3.0	4.0	5.0
May 1954									
4-----	0.75	0.84	0.97	1.15	----	----	----	----	----
7-----	.80	.90	1.01	1.16	----	----	----	----	----
12----	.83	.90	1.03	1.19	1.38	1.09	----	----	----
13----	.73	.85	1.02	1.19	1.40	----	0.97	0.84	0.76
14----	.80	.89	1.01	1.18	1.34	----	----	----	----
16----	----	----	----	----	----	1.13	.98	.86	.76
17----	.86	.94	1.06	1.22	1.42	----	----	----	----
18----	----	----	1.05	1.19	----	----	----	----	----
19----	----	----	----	----	1.46	1.12	.95	.80	.68
20----	.85	.96	1.09	1.25	1.43	----	----	----	----
22**--	.54	.69	.83	1.00	1.28	.94	.74	.56	.43
25----	.76	.88	1.04	1.24	1.45	----	----	----	----
29----	.86	.95	1.06	----	----	----	----	----	----
30----	.75	.86	.98	1.13	----	----	----	----	----
Averages	.78	.88	1.01	1.17	1.40	1.07	.91	.77	.66
Departures	.15	.12	.08	.08	.04	.02	.04	----	----

* Data not available for publication in monthly issues
# Extrapolated
** Haze

Langley is the unit used to denote one gram calorie per square centimeter.

An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

ILLUMINATION DATA

Table 34*.-Daily illumination on a horizontal surface, tabulated in hundreds of foot-candle hours.

Station	Day of month																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average
Washington, D. C. (W8CO)																																
June 1954-----	---	879	693	537	489	864	732	644	544	236	716	712	548	591	406	120	245	826	813	821	(820)	794	---	---	---	-	---	---	---	---	---	---
July 1954-----	---	---	---	---	---	---	---	422	462	515	649	831	737	754	649	846	718	566	621	796	346	775	839	820	656	814	---	---	---	(616)	727	---
Aug. 1954-----	680	407	517	766	166	812	727	622	303	610	776	774	775	612	291	670	768	616	487	590	122	681	612	616	561	422	167	170	628	397	693	550
Sept. 1954----	712	665	---	---	---	---	---	442	329	240	531	644	629	589	259	(519)	586	431	314	---	---	(586)	600	568	528	414	557	490	491	422	---	---
Oct. 1954-----	357	269	397	466	322	149	526	460	466	450	478	476	444	---	44	381	431	---	---	400	386	416	(400)	396	352	---	(100)	390	333	240	324	---
Nov. 1954-----	326	30	216	164	256	181	334	328	336	316	314	268	291	286	275	72	(105)	52	77	62	194	224	79	56	134	119	184	130	270	228	---	(197)
Dec. 1954-----	134	104	215	137	171	231	218	226	35	166	198	108	34	29	52	88	---	68	198	220	234	222	230	86	246	234	217	121	27	240	202	156

The foot-candle hour is the average illumination for one hour, in foot-candles. Foot-candle hours for a day are obtained by summing the foot-candle hours for the individual hours of that day. The illumination values are compiled from continuous records of the illumination output of a Foster Illuminometer. For a description of this instrument see "A Recording Daylight Illuminometer", by Norman 8. Foster, in Illuminating Engineering, Vol. XLVI No. 2, pages 59 to 62.

* Data not available for publication in monthly issues.

ATMOSPHERIC OZONE

Total atmospheric ozone in centimeters as measured with Dobson ozone spectrophotometers.

YEAR 1954

	Albuquerque, N. Mex.	Bismarck, N. Dak.	Fort Worth, Tex.	Washington, D. C. (WBCD)		Albuquerque, N. Mex.	Bismarck, N. Dak.	Fort Worth, Tex.	Washington, D. C. (WBCD)		Albuquerque, N. Mex.	Bismarck, N. Dak.	Fort Worth, Tex.	Washington, D. C. (WBCD)		Albuquerque, N. Mex.	Bismarck, N. Dak.	Fort Worth, Tex.	Washington, D. C. (WBCD)		Albuquerque, N. Mex.	Bismarck, N. Dak.	Fort Worth, Tex.	Washington, D. C. (WBCD)		Albuquerque, N. Mex.	Bismarck, N. Dak.	Fort Worth, Tex.	Washington, D. C. (WBCD)
1954 Jan.					Feb.					Mar.					Apr.					May					June				
1----------	----	----	0.18	----		0.22	0.24	0.20	0.26		0.28	----	0.21	----		0.25	----	0.21	0.31		----	----	----	----		0.26	----	0.23	0.26
2----------	0.21	0.22	.18	----		.24	.28	.22	.30		.27	0.32	.25	0.27		.25	0.29	.22	.34		----	0.32	0.23	----		.24	----	----	.24
3----------	----	.21	.18	----		.24	.22	.23	----		.26	.31	.22	.30		----	----	.22	----		0.24	.33	.24	0.28		----	0.28	.22	----
4----------	----	.34	.20	0.29		.24	.25	.22	.31		.28	.29	----	.30		----	.30	.19	----		.25	.31	.22	.28		.24	.27	.25	----
5----------	.22	.26	.20	.24		.23	----	.22	.31		.25	.26	----	.31		----	----	----	----		.26	----	.25	.28		----	----	.23	----
6----------	.21	.22	.20	.23		.24	.24	.21	----		.23	.25	.23	----		----	----	.21	.28		.27	.32	.26	.31		----	----	.22	----
7----------	.22	----	.20	.27		----	.24	.26	----		----	----	.21	----		----	.30	.22	.26		.27	.31	----	----		.26	----	.21	----
8----------	----	.27	.20	.24		.23	.22	.22	.28		.22	.29	.23	.29		----	.31	----	.27		----	.30	.26	----		.25	.28	.21	----
9----------	----	.26	----	----		.22	.21	.19	.30		.22	----	.20	.33		----	.32	.21	.27		----	.30	----	----		.24	.28	.20	----
10----------	----	----	----	----		.22	.28	.18	.25		----	.28	.20	.32		----	.30	.22	----		.29	.30	----	.34		.24	----	.21	.24
11----------	.23	.21	.21	----		.22	.25	.20	.22		----	----	.20	----		----	.30	.21	----		----	.31	----	.31		----	.27	.21	.24
12----------	----	----	----	----		.22	.28	.22	----		.30	.29	.22	----		----	.30	----	.28		.28	.28	----	.30		----	.28	.21	----
13----------	.24	----	----	----		.22	----	----	----		----	.30	----	----		----	.30	----	.29		----	.27	.25	.29		----	.24	.20	----
14----------	.25	.34	----	----		----	----	.19	----		----	.31	.22	----		----	.33	----	.30		.28	.32	.25	----		----	----	.22	.28
15----------	.24	.28	----	----		----	.28	----	.22		----	----	.21	----		----	.32	.23	----		----	.29	.25	----		.25	.28	----	.25
16----------	----	----	----	----		.24	.27	.20	.23		----	.25	.22	.32		----	.29	.27	----		----	.28	.26	----		----	.28	.22	----
17----------	----	----	----	----		.23	.26	.19	.28		----	.27	----	.36		----	----	.24	----		----	.29	----	.28		.24	----	.23	----
18----------	----	.26	----	----		.25	.25	.20	.26		.25	----	.23	.36		----	.31	.22	----		.26	.32	----	.27		.24	.28	.23	.26
19----------	.23	.31	----	.26		.27	.29	.21	.28		.26	.27	.24	.30		----	.33	.22	.26		.26	.29	.24	----		----	.29	.23	----
20----------	----	.25	.21	----		.27	.27	.24	----		----	----	.22	----		----	----	.23	.25		.28	.28	.24	----		----	----	.24	----
21----------	.23	.30	----	----		----	.28	.22	----		----	----	.22	----		----	----	----	.26		----	.27	.25	.31		.24	.28	.23	.25
22----------	.22	.29	.20	----		.27	----	.22	----		----	.31	----	.30		----	----	----	.26		----	----	.23	----		----	.24	.23	.25
23----------	.23	----	.20	----		.27	.26	.28	.30		----	.28	----	.29		----	.31	----	.27		----	----	----	----		.24	.24	.22	.26
24----------	----	.24	.20	----		.24	.36	.22	.27		----	----	----	.26		----	.30	.24	----		----	.28	----	.28		.25	.26	.22	.24
25----------	----	.28	----	----		.25	----	.21	.28		----	.32	.20	.23		----	----	.23	----		.26	.28	----	.23		.24	.25	.22	.25
26----------	.23	----	----	.22		----	.30	.20	.32		.30	.29	.21	----		----	----	----	.29		.27	----	----	.27		----	.25	.31	----
27----------	.22	.31	.20	.24		.28	.34	.20	----		.24	----	.18	----		----	.31	----	.28		.27	.31	.24	.29		----	.24	.31	----
28----------	.22	.27	.22	----		----	----	.26	----		----	.40	.23	----		.25	----	.23	.31		.26	----	.23	.23		.24	.27	.32	.30
29----------	.22	.24	----	.30		----	----	----	----		----	.35	.21	.31		.29	.30	----	.29		----	.31	.23	----		.24	.28	----	.24
30----------	.23	.27	----	----		----	----	----	----		.26	.34	----	.30		----	.29	.22	.29		----	.29	.22	----		.24	.26	.24	.24
31----------	----	.19	.23	----		----	----	----	----		----	.32	----	----		----	----	----	----		.26	.30	.23	----		----	----	----	----
Monthly Mean------	.23	.26	.20	.25		.24	.27	.22	.27		.26	.30	.22	.30		.26	.31	.22	.28		.27	.30	.24	.28		.24	.27	.23	.25

ATMOSPHERIC OZONE

Total atmospheric ozone in centimeters as measured with Dobson ozone spectrophotometers-Continued.

YEAR 1954

	Albuquerque, N. Mex.	Bismarck, N. Dak.	Fort Worth, Tex.	Washington, D. C. (WBCD)		Bismarck, N. Dak.	Fort Worth, Tex.	Washington, D. C. (WBCD)		Bismarck, N. Dak.	Fort Worth, Tex.	Washington, D. C. (WBCD)		Bismarck, N. Dak.	Fort Worth, Tex.	Washington, D. C. (WBCD)		Bismarck, N. Dak.	Fort Worth, Tex.	Washington, D. C. (WBCD)		Bismarck, N. Dak.	Fort Worth, Tex.	Washington, D. C. (WBCD)
July					Aug.				Sept.				Oct.				Nov.				Dec.			
1----------	----	0.28	0.25	0.25		0.28	----	----		0.25	0.21	0.23		0.26	----	0.21		0.22	----	0.26		0.28	----	0.20
2----------	----	----	----	.27		.28	----	0.24		.25	.20	.24		.26	0.18	----		.21	0.19	----		.25	----	.25
3----------	----	.27	.21	----		.27	0.21	.24		.25	.20	.23		.24	.18	----		.28	----	.28		.22	0.18	.26
4----------	----	.24	----	----		.26	.21	.26		.24	.20	----		----	.18	.20		.22	.19	----		.23	.19	----
5----------	----	.25	.20	----		.26	.21	.21		.24	.20	----		.23	.18	.20		.19	.20	.20		.26	.19	----
6----------	0.24	.26	.21	.27		.26	.21	.26		.25	.20	----		.23	.20	----		.18	.19	----		----	.20	.28
7----------	----	.26	.22	.25		.27	.20	----		.25	.21	.24		.22	----	.22		.19	.19	----		----	.19	.30
8----------	.24	.28	.22	.26		.28	.21	----		----	.20	.24		.22	.20	.22		.20	----	.21		.23	.19	.19
9----------	.24	.26	.22	.32		.27	----	.25		.26	.20	.23		.19	.19	----		.19	----	.21		.23	.20	
10----------	----	.27	.22	----		.28	.22	.26		.26	.20	----		.21	----	----		.20	.20	.22		.24	----	.27
11----------	----	.25	.22	----		.27	.22	.25		.25	.20	----		.23	----	.21		.20	.19	----		.24	----	----
12----------	----	.27	.22	.25		.26	.22	.24		.24	.20	----		.26	.19	.21		.21	.19	.21		.23	----	----
13----------	----	.25	.22	.25		.26	.22	.23		----	.20	.23		.26	.18	.22		.15	.18	----		----	.19	----
14----------	----	.25	----	.25		.26	.21	----		.24	.20	.23		.25	.18	.20		.20	----	----		.26	.18	----
15----------	----	.26	.22	.23		.26	.21	----		.23	.20	----		.22	.18	----		.22	.14	.21		.25	.19	----
16----------	----	.25	.21	.26		.26	.21	.22		----	.21	.23		.22	.18	---		.22	.18	----		----	.18	.16
17----------	----	.26	.22	----		.27	.21	.23		----	.19	----		.21	.18	----		.22	.18	----		.26	.22	----
18----------	----	.27	.22	----		.30	.20	.24		.25	----	----		.22	.18	.23		.22	.18	----		----	.23	----
19----------	----	.27	.23	.25		.28	.21	.25		.23	.19	----		.21	.19	.25		.21	.20	----		.20	.19	----
20----------	----	.27	.22	.25		.28	.19	.24		.25	.19	----		.23	.19	.25		----	.18	----		.19	.20	.29
21----------	----	.27	.22	.24		.27	.19	----		.24	.19	----		----	----	.25		.21	.21	----		.22	.19	.26
22----------	----	.27	.22	.24		.26	.20	----		.23	.19	----		.20	----	.23		.20	.21	.23		.20	.20	.26
23----------	----	.27	.21	.26		.26	.20	.24		.24	.19	.24		.20	----	----		----	.18	----		.21	----	.21
24----------	----	.27	.21	----		.26	.21	.24		.24	.20	.20		----	.20	----		.21	.18	----		.20	.21	----
25----------	----	.26	.22	----		.26	.21	.24		.22	.20	----		----	----	.22		.20	.20	----		.24	----	----
26----------	----	.27	.23	.26		----	.20	.23		.21	.20	----		.24	----	----		.21	.18	.26		.24	----	----
27----------	----	.27	.24	.25		.25	.21	----		.22	.21	.23		.20	----	----		----	.18	----		.29	----	.21
28----------	----	.28	.22	.27		.24	.20	----		.23	.19	.23		.18	----	.22		----	.18	----		----	----	.19
29----------	----	.26	.22	.24		.24	.21	----		----	.18	.23		.24	----	.21		.25	.18	.22		.26	.19	.20
30----------	----	----	----	.24		.24	.21	.24		----	----	.21		----	----	----		----	----	.19		.24	.19	----
31----------	----	.27	----	----		.24	----	.23		----	----	----		.25	----	----		----	----	----		.22	.20	.20
Monthly Mean------	.24	.26	.22	.26		.26	.21	.24		.24	.20	.23		.23	----	.22		.21	.19	.22		.24	.20	.23

NWRC, Asheville, N. C. --- 5/20/55 --- 2350

Chart I. Departure from Normal of Annual Average Temperature (°F.) at Surface, 1954.

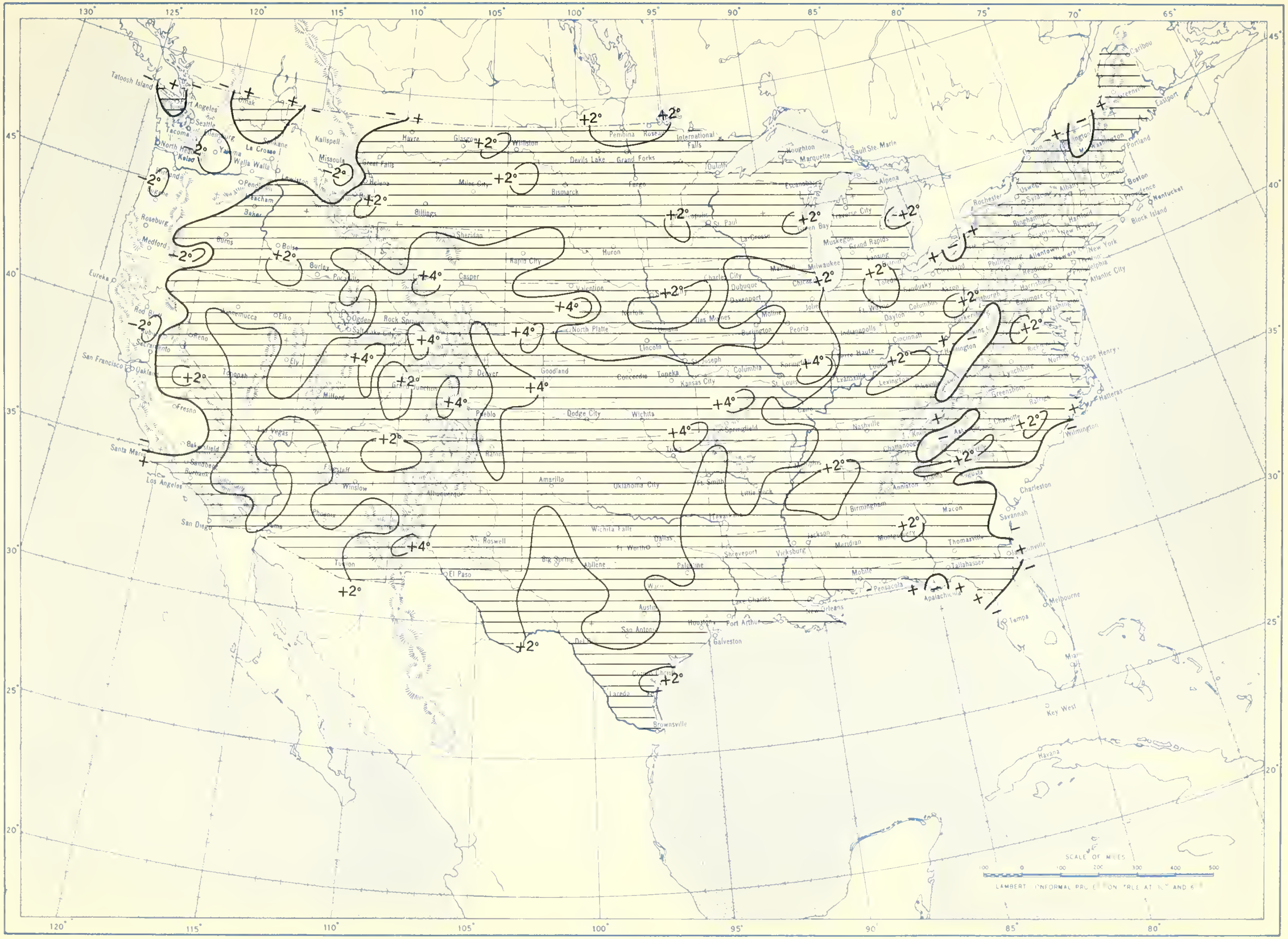


Chart II. Percentage of Normal Annual Precipitation, 1954.

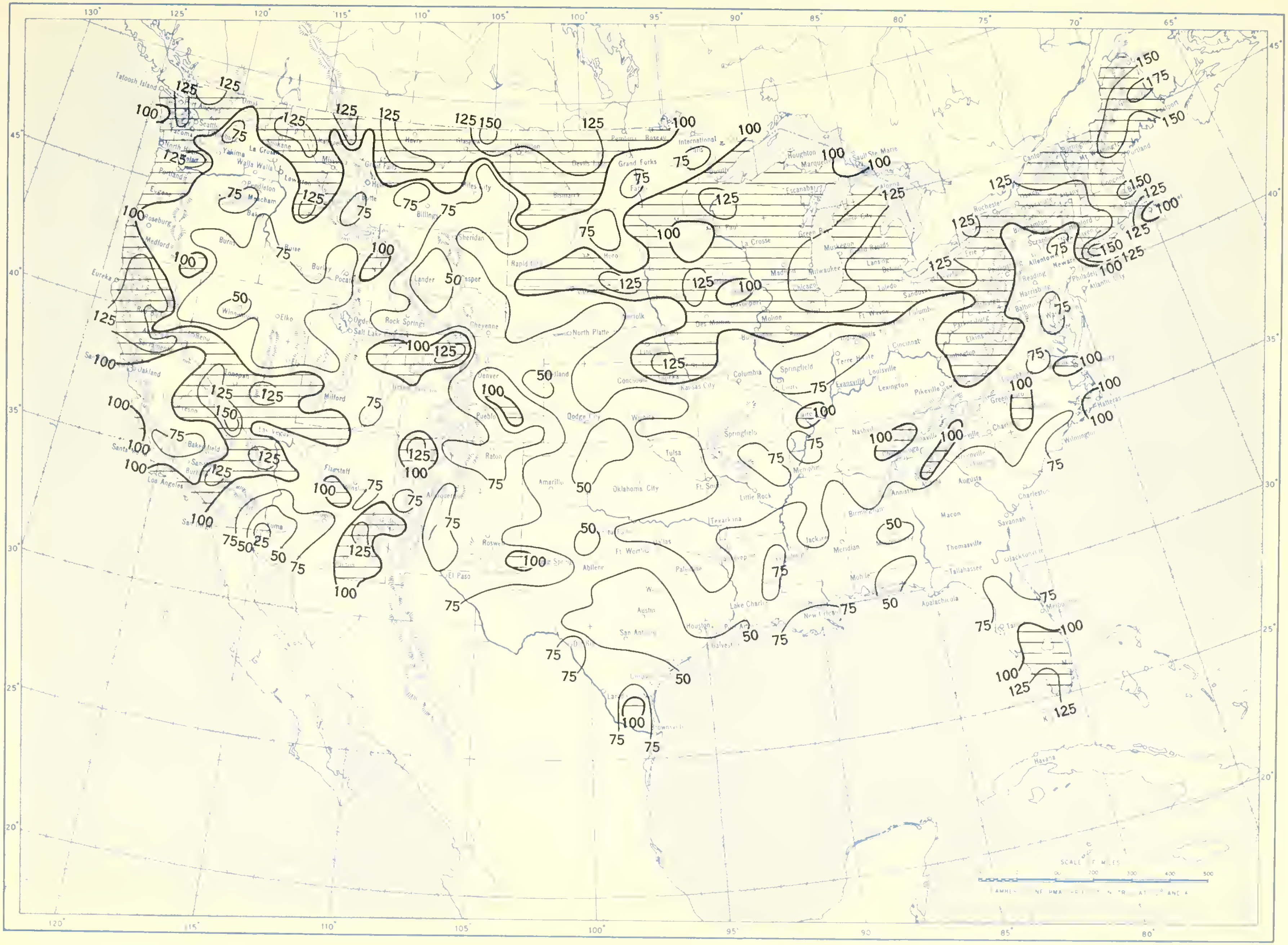


Chart III. Tracks of Tornadoes, 1954.

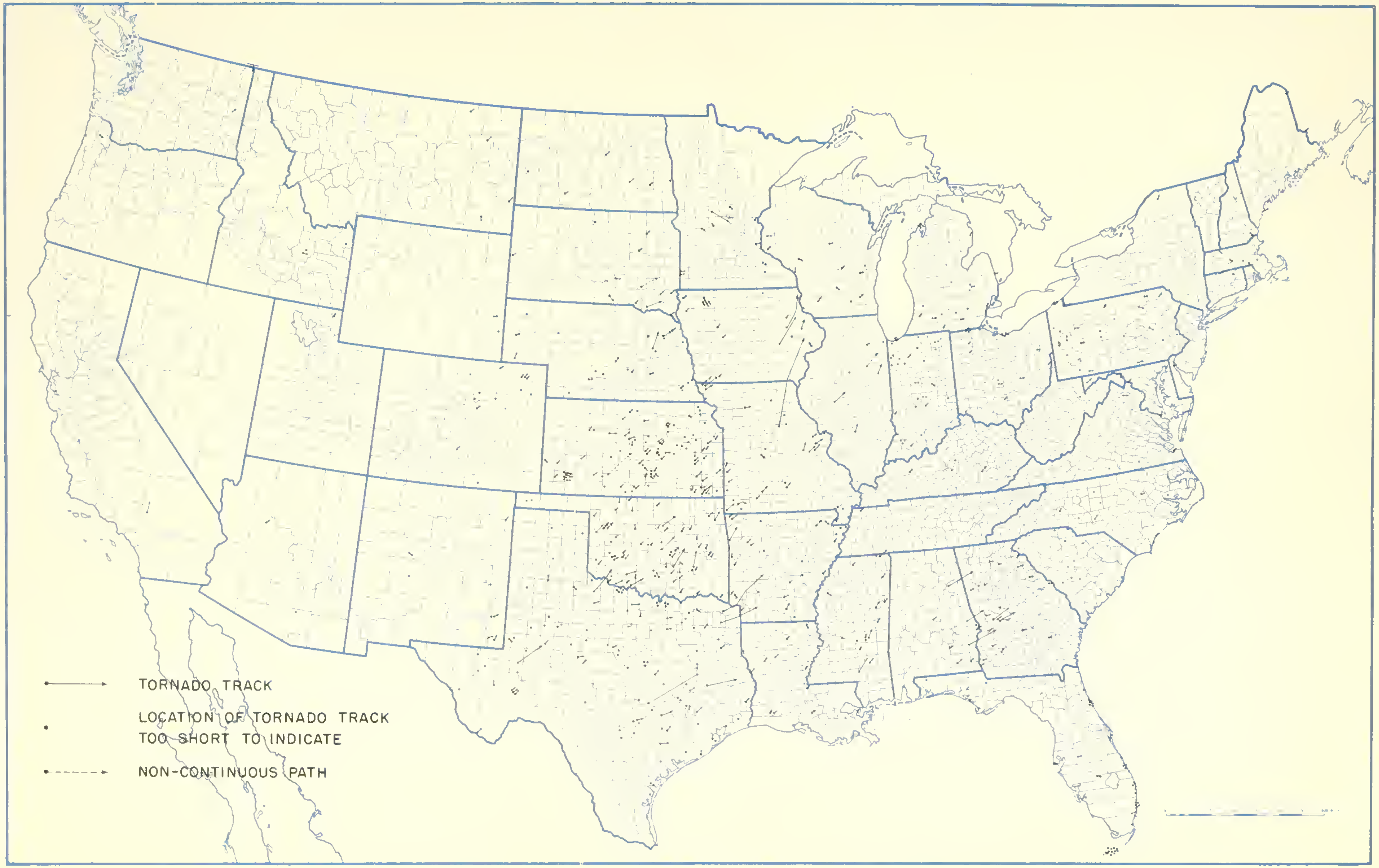
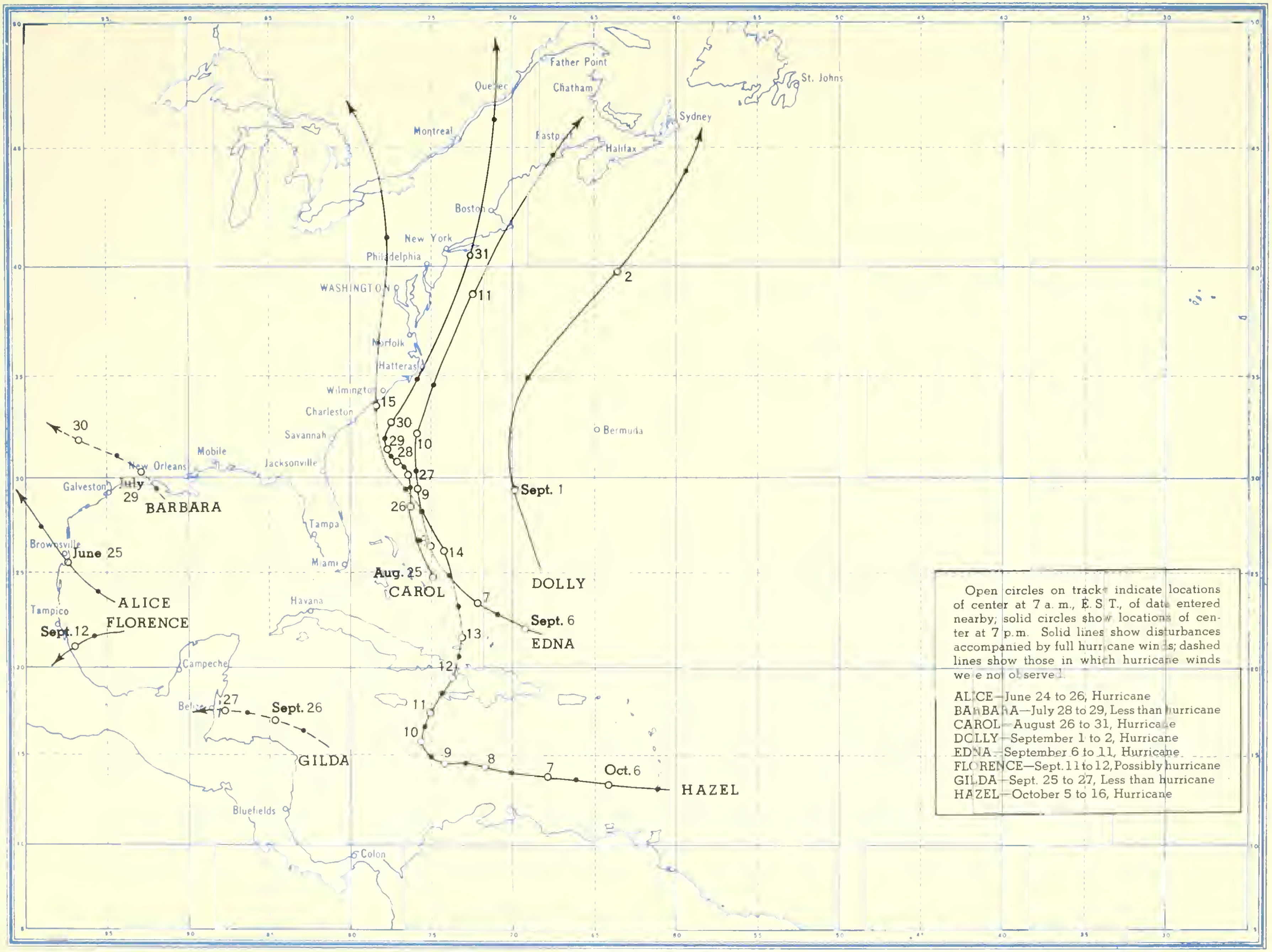


Chart IV. Tracks of North Atlantic Hurricanes and Tropical Disturbances, 1954.



Open circles on tracks indicate locations of center at 7 a. m., E. S. T., of date entered nearby; solid circles show locations of center at 7 p.m. Solid lines show disturbances accompanied by full hurricane winds; dashed lines show those in which hurricane winds were not observed.

ALICE—June 24 to 26, Hurricane
BARBARA—July 28 to 29, Less than hurricane
CAROL—August 26 to 31, Hurricane
DOLLY—September 1 to 2, Hurricane
EDNA—September 6 to 11, Hurricane
FLORENCE—Sept. 11 to 12, Possibly hurricane
GILDA—Sept. 25 to 27, Less than hurricane
HAZEL—October 5 to 16, Hurricane

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